Dealer's Manual

SHIMANO DURA-ACE 9070 Series

SW-R610
SW-9071
SW-R671

ST-9070
ST-9071

FD-9070
RD-9070

SM-EW90-A
SM-EW90-B

EW-SD50
EW-SD50-I
SM-EWC2
SM-JC40
SM-JC41

SM-BTR1
SM-BTR2
SM-BMR1 (Ver.2.0.0 later)
SM-BMR2
SM-BA01
SM-BCR1
SM-BCR2
SM-BCC1

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IMPORTANT NOTICE

- **This dealer's manual is intended primarily for use by professional bicycle mechanics.**
  Users who are not professionally trained for bicycle assembly should not attempt to install the components themselves using the dealer's manuals.
  If any part of the information on the manual is unclear to you, do not proceed with the installation. Instead, contact your place of purchase or a local bicycle dealer for their assistance.
- Make sure to read all instruction manuals included with the product.
- Do not disassemble or modify the product other than as stated in the information contained in this dealer's manual.
- All dealer's manuals and instruction manuals can be viewed on-line on our website (**http://si.shimano.com**).
- Please observe the appropriate rules and regulations of the country, state or region in which you conduct your business as a dealer.

For safety, be sure to read this dealer's manual thoroughly before use, and follow it for correct use.

The following instructions must be observed at all times in order to prevent personal injury and physical damage to equipment and surroundings.
The instructions are classified according to the degree of danger or damage which may occur if the product is used incorrectly.

⚠ DANGER

Failure to follow the instructions will result in death or serious injury.

⚠ WARNING

Failure to follow the instructions could result in death or serious injury.

⚠ CAUTION

Failure to follow the instructions could cause personal injury or physical damage to equipment and surroundings.

TO ENSURE SAFETY

⚠ DANGER

Be sure to also inform users of the following:

Be sure to observe the following in order to avoid burns or other injury from fluid leakages, overheating, fire or explosions.

< Lithium ion battery >

- Use the dedicated charger to charge the battery. If any non-specified items are used, fire, overheating or leakages may occur.
- Do not heat the battery or throw it into fire. If this is not observed, fire or bursting may occur.
- Do not disassemble or modify the battery or apply solder directly to the battery terminals. Do not leave the battery in places which may exceed 60 °C in temperature, such as places which are exposed to direct sunlight inside vehicles on hot days or near stoves. If this is not observed, leakages, overheating or bursting may cause fire, burns or other injury to occur.
- Do not connect the (+) and (-) terminals with metallic objects. Do not carry or store the battery together with metallic objects such as necklaces or hairpins. If this is not observed, short-circuits, overheating, burns or other injury may occur.
- If any liquid leaking from the battery gets into the eyes, immediately wash the affected area with clean water without rubbing the eyes, and then seek medical advice. If this is not done, blindness may occur.

< Battery charger / Battery charger cord >

- Do not get the charger wet or use it while it is wet, and do not touch or hold it with wet hands. If this is not observed, problems with operation or electric shocks may occur.
- Do not cover the charger with a cloth or similar while it is in use. If this is not observed, heat may build up and the case may become deformed, or fire or overheating may occur.
- Do not disassemble or modify the charger. If this is not observed, electric shocks or injury may occur.
- Use the charger at the specified power supply voltage only. If a power supply voltage other than that specified is used, fire, explosions, smoke, overheating, electric shocks or burns may occur.
- Do not touch metallic parts of the charger or the AC adapter if there is a lighting storm. If lightning strikes, electric shocks may occur.

< SM-BCR2: Battery charger for SM-BTR2 >

- Use an AC adapter with a USB port with a voltage of 5.0 Vdc and with a current equal to or higher than 1.0 Adc. If the one with a current lower than 1.0 A is used, the AC adapter may heat up, potentially causing a fire, smoke, overheating, destruction, electric shock, or burns.

⚠ WARNING

- **When installing components, be sure to follow the instructions that are given in the instruction manuals.**
  It is recommended that you use only genuine Shimano parts. If parts such as bolts and nuts become loose or damaged, the bicycle may suddenly fall over, which may cause serious injury.
  In addition, if adjustments are not carried out correctly, problems may occur, and the bicycle may suddenly fall over, which may cause serious injury.
-  Be sure to wear safety glasses or goggles to protect your eyes while performing maintenance tasks such as replacing parts.
- This dealer's manual is for use with the DURA-ACE 9070 series (electronic gear shifting system) only. For any information regarding the ULTEGRA 6770 series which does not appear in this manual, refer to the Service Instructions included with each component.
- After reading the dealer's manual thoroughly, keep it in a safe place for later reference.

Be sure to also inform users of the following:

- ***Maintenance interval depends on the usage and riding circumstances. Clean regularly the chain with an appropriate chaincleaner. Never use alkali based or acid based solvents such as rust cleaners. If those solvent be used chain might break and cause serious injury.***
- Check that the wheels are fastened securely before riding the bicycle. If the wheels are loose in any way, they may come off the bicycle and serious injury may result.
- Check the chain for any damage (deformation or crack), skipping, or other abnormalities such as unintended gear shifting. If any problems are found, consult a dealer or an agency. The chain may break, and you may fall.
- Be careful not to let the cuffs of your clothes get caught in the chain while riding, otherwise you may fall off the bicycle.

< Lithium ion battery >

- Do not place the battery into fresh water or sea water, and do not allow the battery terminals to get wet. If this is not observed, fire, bursting or overheating may occur.
- Do not use the battery if it has any noticeable scratching or other external damage. If this is not observed, bursting, overheating or problems with operation may occur.
- Do not subject the battery to strong shocks or throw it. If this is not observed, bursting, overheating or problems with operation may occur.
- Do not use the battery if leakages, discoloration, deformation or any other abnormalities occur. If this is not observed, bursting, overheating or problems with operation may occur.
- If any leaked fluid gets on your skin or clothes, wash it off immediately with clean water. The leaked fluid may damage the skin.

< SM-BTR1: Lithium ion battery (external type) >

- If charging is not complete after 1.5 hours of charging time has elapsed, stop the charging. If this is not observed, fire, bursting or overheating may occur.
- The operating temperature ranges for the battery are given below. Do not use the battery in temperatures outside these ranges. If the battery is used or stored in temperatures which are outside these ranges, fire, injury or problems with operation may occur.
  1. During discharge: –10 °C - 50 °C
  2. During charging: 0 °C - 45 °C

< SM-BTR2: Lithium ion battery (built-in type) >

- If the battery does not become fully charged after 4 hours of charging, stop charging.
- The operating temperature ranges for the battery are given below. Do not use the battery in temperatures outside these ranges. If the battery is used or stored in temperatures which are outside these ranges, fire, injury or problems with operation may occur.
  1. During discharge: –10 °C - 50 °C
  2. During charging: 0 °C - 45 °C

< Battery charger / Battery charger cord >

- Hold the power plug whenever connecting and disconnecting the plug. Failure to do so may cause a fire or electric shock.
  If the following symptoms are observed, stop using the device and contact a dealer. A fire or electric shock may be caused.
  * If heat or acrid-smelling smoke is coming out from the power plug.
  * There may be a bad connection inside the power plug.
- Do not overload the electrical outlet with appliances beyond its rated capacity, and use only a 100 – 240 V AC electrical outlet. If the electrical outlet is overloaded by connecting too many appliances using adapters, overheating resulting in fire may occur.
- Do not damage the power cord or power plug. (Do not damage, process, forcibly bend, twist or pull them, bring them near hot objects, place heavy objects on them or bundle them tightly together.) If they are used while damaged, fire, electric shocks or short-circuits may occur.
- Do not use the charger with commercially-available electrical transformers designed for overseas use, as they may damage the charger.
- Always be sure to insert the power plug as far as it will go. If this is not observed, fire may occur.

< SM-BCR2: Battery charger for SM-BTR2 >

- Do not use any USB cable other than the USB cable which is supplied with the PC linkage device. This may cause a charge error, fire, or failure of the connected PC due to heating.
- Do not connect the charger to PC when it is on standby. This may cause a failure of PC depending on its specifications.
- When connecting or disconnecting the USB cable or the charging cable, be sure to hold the plug of the cable. Failure to do so may cause a fire or electric shock.
  If the following symptoms are observed, stop using the device and contact a dealer. A fire or electric shock may be caused.
  * If heat or acrid-smelling smoke is coming out from the power plug.
  * There may be a bad connection inside the power plug.
- If it thunders while charging with an AC adapter with a USB port, do not touch the device, bicycle, or the AC adapter. When lightning strikes, an electric shock may be caused.
- Use an AC adapter with a USB port with a voltage of 5.0 Vdc and with a current equal to or higher than 1.0 Adc. If the one with a current lower than 1.0 Adc is used, a charge error may occur or the AC adapter may heat up, leading to a fire.
- Do not use a USB hub when connecting the cable to a PC USB port. This may cause a charge error or fire due to heating.
- Be careful not to damage the charging cable. (Do not damage, process, forcibly bend, twist or pull them, bring them near hot objects, place heavy objects on them or bundle them tightly together.) If they are used while damaged, fire, electric shocks or short-circuits may occur.

< Brake >

- It is important to completely understand the operation of your bicycle's brake system. Improper use of your bicycle's brake system may result in a loss of control or a fall, which could lead to severe injury. Because each bicycle may handle differently, be sure to learn the proper braking technique (including brake lever pressure and bicycle control characteristics) and operation of your bicycle. This can be done by consulting your professional bicycle dealer and the bicycle's owners manual, and by practicing your riding and braking technique.
- If the front brake is applied too strongly, the wheel may lock and the bicycle may fall forward, and serious injury may result.
- Always make sure that the front and rear brakes are working correctly before you ride the bicycle.
- The required braking distance will be longer during wet weather. Reduce your speed and apply the brakes early and gently.
- If the road surface is wet, the tires will skid more easily. If the tires skid, you may fall off the bicycle. To avoid this, reduce your speed and apply the brakes early and gently.

< Dual control lever >

- The lever should never be processed because of the properties of carbon. Otherwise, the lever may break, and braking may become disabled.
- Check before riding that there is no damage such as carbon separation or cracking. If there is any damage, stop using the bicycle and consult a dealer or an agency. Otherwise, the lever may break, and braking may become disabled.

For Installation to the Bicycle, and Maintenance:

- **When the shifting switch is operated, the motor which drives the front derailleur will operate to the shifting position without stopping, so be careful not to get your fingers caught.**

< ST-9071 / SW-9071 / SW-R671 >

< Points to note about the handlebars >

- Handle inner diameter: 19.0 - 22.5 mm
- Handle outer diameter: 22.2 - 24.0 mm
- Applicable handlebars: Carbon fiber handlebars (with aluminum inserts where the brake levers are installed) or aluminum handlebars.

  * Carbon fiber handlebars without aluminum inserts where the brake levers are installed cannot be used.

⚠ CAUTION

Be sure to also inform users of the following:

< SM-BCR1: Battery charger for SM-BTR1 >

- Disconnect the power plug from the electrical outlet before cleaning the charger.

< SM-BCR2: Battery charger for SM-BTR2 >

- Disconnect the USB cable or the charging cable when performing maintenance.

< Lithium ion battery >

- Store the battery in a safe place away from the reach of infants and pets.

< SM-BTR1: Lithium ion battery (external type) >

- When you do not use the battery for a long period, remove and charge the battery before storage.

< SM-BTR2: Lithium ion battery (built-in type) >

- When you do not use the battery for a long period, charge the battery before storage.

NOTE

Be sure to also inform users of the following:

- Be sure to rotate the crank when carrying out any switch operations which are related to gear shifting.
- This is a small waterproof connector. Do not repeat connecting and disconnecting it. It may impair the function.
- Be careful not to let water get into the terminal.
- The components are designed to be fully waterproofed to withstand wet weather riding conditions; however, do not deliberately place them into water.
- Do not clean the bicycle in a high-pressure car wash. If water gets into any of the components, operating problems or rusting may result.
- Handle the products carefully, and avoid subjecting them to any strong shocks.
- Do not use thinners or similar substances to clean the products. Such substances may damage the surfaces.
- If gear shifting operations do not feel smooth, wash the derailleur and lubricate all moving parts.
- Contact the place of purchase for updates of the product software. The most up-to-date information is available on the Shimano website.
- Products are not guaranteed against natural wear and deterioration from normal use and aging.
- For maximum performance we highly recommend Shimano lubricants and maintenance products.

< Battery charger / Battery charger cord >

- Use this instrument under the direction of a safety supervisor or the direction for use. Do not allow physically, sensory, or mentally impaired persons, inexperienced persons, or persons with no required knowledge including children to use this instrument.
- Do not allow children to play near this instrument.



Disposal information for countries outside the European Union

This symbol is only valid within the European Union.
Contact the place of purchase or your nearest Shimano agent for advice on disposing of used products.





< Lithium ion battery >

- Lithium ion batteries are recyclable, valuable resources.
  For information on used batteries, contact the place of purchase or a bicycle dealer.
- Charging can be carried out at any time regardless of the amount of charge remaining. Always be sure to use the special battery charger to charge the battery until it is fully recharged.
- The battery is uncharged at the time of purchase. Before riding, be sure to charge the battery until it is fully charged.
- If the battery has become fully spent, charge it as soon as possible. If you leave the battery without charging it, it will cause the battery to deteriorate.
- The battery is a consumable item. The battery will gradually lose its capacity for charging after repeated use and after time has passed. If the length of time that the battery can be used becomes extremely short, it has probably reached the end of its life, and so you will need to purchase a new battery.
- The life of the battery will vary depending on factors such as the storage method, the usage conditions, the surrounding environment and the characteristics of the individual battery pack.
- If storing the battery away for a long period, remove it when the battery level is 50% or higher or when the green indicator is illuminating in order to prolong its useful life. It is recommended that you charge the battery about once every half a year.
- If the storage temperature is high, the performance of the battery is reduced, and its available time will be shorter. When you use the battery after a long storage period, store the battery indoors where the battery will not be exposed to direct sunlight or rain.
- If the ambient temperature is low, the available time of the battery will be shorter.

< SM-BTR1: Lithium ion battery (external type) >

- When storing the battery away, remove the battery from the bicycle and install the terminal cover first.
- The charging time is approximately 1.5 hours. (Note that the actual time will vary depending on the amount of charge remaining in the battery.)
- If the battery feels difficult to insert or remove, apply specified grease (premium grease) to the part that touches the O-ring at the side.

< SM-BTR2: Lithium ion battery (built-in type) >

- After removing the battery from the bicycle for storage, install a dummy plug.
- The charging time of an AC adapter with a USB port is about 1.5 hours, and that of computer USB port type about 3 hours. (Note that the actual time will vary depending on the amount of charge remaining in the battery. Depending on the specifications of the AC adapter, recharging via the AC adapter requires as many hours (about 3 hours) as recharging via PC.)

< Battery charger / Battery charger cord >

- Charge the battery in indoor places to avoid exposure to rain or wind.
- Do not use outdoors or in environments with high humidity.
- Do not place the PC linkage device on dusty floors when using it.
- Place the PC linkage device on a stable surface such as a table when using it.
- Do not place any objects on top of the PC linkage device or its cables.
- Do not wrap the cables into bundles.
- Do not hold the PC linkage device by the cables when carrying it.
- Do not apply excessive tension to the cables.
- Do not wash the PC linkage device or wipe it using detergents.
- Use this instrument under the direction of a safety supervisor or the direction for use. Do not allow physically, sensory, or mentally impaired persons, inexperienced persons, or persons with no required knowledge including children to use this instrument.
- Do not allow children to play near this instrument.

< SM-BCR2 : Battery charger for SM-BTR2 >

- Connect the PC linkage device directly to a computer, without using an intermediate device such as a USB hub.
- Do not ride the bicycle while the PC linkage device and cable are still connected to it.
- Do not connect two or more of the same units to the same connection point. If this is not done, the units may not operate correctly.
- Do not connect or disconnect units again while unit recognition is in progress or after recognition is complete. If this is not done, the units may not operate correctly.
  Check the procedures which are given in the user's manual for the E-tube Project when connecting and disconnecting units.
- The tightness of the PC link cable will tend to drop after repeated connections and disconnections. If this happens, replace the cable.
- Do not connect two or more PC linkage device at the same time. If two or more PC linkage device units are connected, they will not operate correctly. In addition, operating errors may occur at the PC and it may require the PC to be restarted.
- PC linkage devices cannot be used while the charger is connected.

< Rear derailleur >

- If gear shifting operations do not feel smooth, wash the derailleur and lubricate all moving parts.
- If there is a large amount of play in the pulleys which causes a lot of annoying noise, ask the place of purchase to replace the pulleys.
- If the chain keeps skipping, ask the place of purchase to replace the chainrings, sprockets and/or the chain.
- You should periodically wash the chainrings in a neutral detergent. In addition, cleaning the chain with neutral detergent and lubricating it can be an effective way of extending the useful life of the chainrings and the chain.
- If the amount of looseness in the links is so great that adjustment is not possible, you should replace the derailleur.

< Dual control lever >

- In the case of carbon levers, wash them by using a soft cloth. Be sure to use a neutral detergent. Otherwise, the material may get damaged, and the strength may be affected.
- Avoid leaving the carbon levers in places where high temperatures are present. Also keep them well away from fire.

For Installation to the Bicycle, and Maintenance:

- Be sure to attach dummy plugs to any unused terminals.
- Always be sure to use the TL-EW02 special tool to remove the electric wires.
- The motors of the motor unit cannot be repaired.
- Contact Shimano for information regarding the shipment of the battery charger to South Korea and Malaysia.
- Use an outer casing which still has some length to spare even when the handlebars are turned all the way to both sides. Furthermore, check that the shifting lever does not touch the bicycle frame when the handlebars are turned all the way.
- Use the specified cable and cable guide to obtain smooth operation.

< Electric wires / Electric wire covers >

- Secure the electric wires with zip ties so that they do not interfere with the chainrings, sprockets and tires.
- The strength of the adhesive is fairly weak, to prevent the paint on the frame from being peeled off at the same time when removing the electric wire cover for reasons such as replacing the electric wires. If the electric wire cover is peeled off, replace it with a new one. When removing the electric wire cover, do not peel it off too vigorously. If this is not observed, the paint on the frame will peel off too.
- Do not remove the wire holders which are attached to the built-in type electric wires (EW-SD50-I). The wire holders prevent the electric wires from moving inside the frame.
- When installing to the bicycle, do not forcibly bend the electric wire plug. It may result in a poor contact.

< Dual control lever >

- Dummy plugs are installed at the time of shipment from the factory. Do not remove them except when necessary.
- When routing the electric wires, take care to ensure that they do not interfere with the brake levers.

< Rear derailleur >

- Always be sure to adjust the top adjustment screw and the low adjustment screw according to the instructions given in the adjustment section. If these bolts are not adjusted, the chain may become clamped between the spokes and the large sprocket and the wheel may lock, or the chain may slip onto the small sprocket.
- You should periodically clean the derailleur and lubricate all moving parts (mechanism and pulleys).
- If gear shifting adjustments cannot be carried out, check the degree of parallel of the rear dropouts.
- The tension pulley has an arrow on it to indicate the direction of rotation. Install the tension pulley so that the arrow is pointing clockwise when looking at the outer side of the derailleur.

< SM-BMR1 / Battery mount >

- This is supported by the firmware versions 2.0.0 and later.

The actual product may differ from the illustration because this manual is intended chiefly to explain the procedures for using the product.

For Installation to the Bicycle, and Maintenance:

< Notes when reinstalling and replacing components >

- When the product is reassembled or replaced, it is automatically recognized by the system to allow operation according to the settings. If the system does not operate after reassembly and replacement, follow the system power reset procedure below to check the operation.
- If the component configuration changes or malfunction is observed, use the E-tube Project software to update the firmware of each component to the latest version and perform a check again. Also make sure that the E-tube Project software is the latest version. If the software is not the latest version, the component compatibility or the product functions may not be sufficiently available.

Be sure to also inform users of the following:

< About used batteries >

- Lithium ion batteries are recyclable, valuable resources.
  For information on used batteries, contact the place of purchase or a bicycle dealer.

< About system power reset >

- When the system fails to operate, the system may be recovered by resetting the system power.
- After the battery is removed, about one minute is usually required for the system power to reset.

< SM-BTR1 >

- Remove the battery from the battery mount. After about one minute, install the battery.

< SM-BTR2 >

- Disconnect the plug from SM-BTR2. After about one minute, insert the plug.

< Connection and communication with the computer >

The PC linkage device can be used to connect a PC to the bicycle (system or component), and an E-tube Project can be used to carry out tasks such as updating firmware of single component and system, and customizing.

- PC Linkage Device: SM-PCE1/SM-BCR2
- E-tube Project: the PC application
- Firmware: the software inside each component

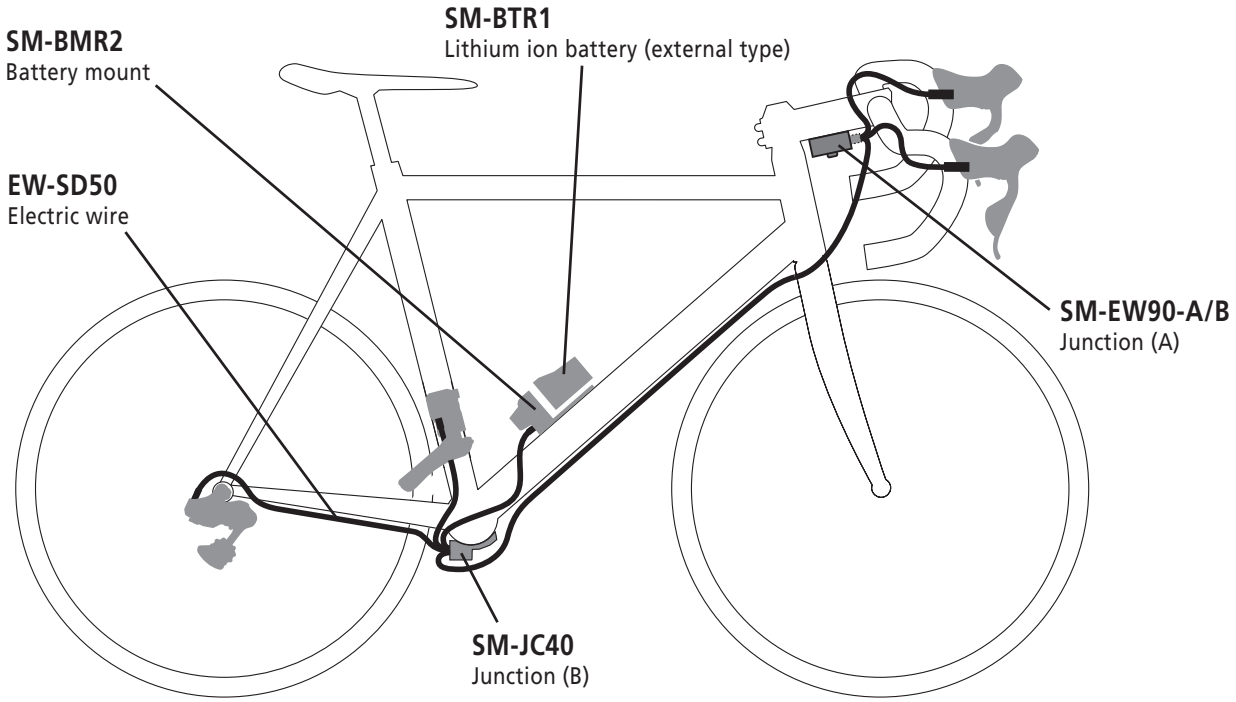
INSTALLATION

This Dealers manual provided a DURA-ACE 9070 series only (electronic gear shifting system).
For other products refer Dealer's Manual of DURA-ACE 9000 series.

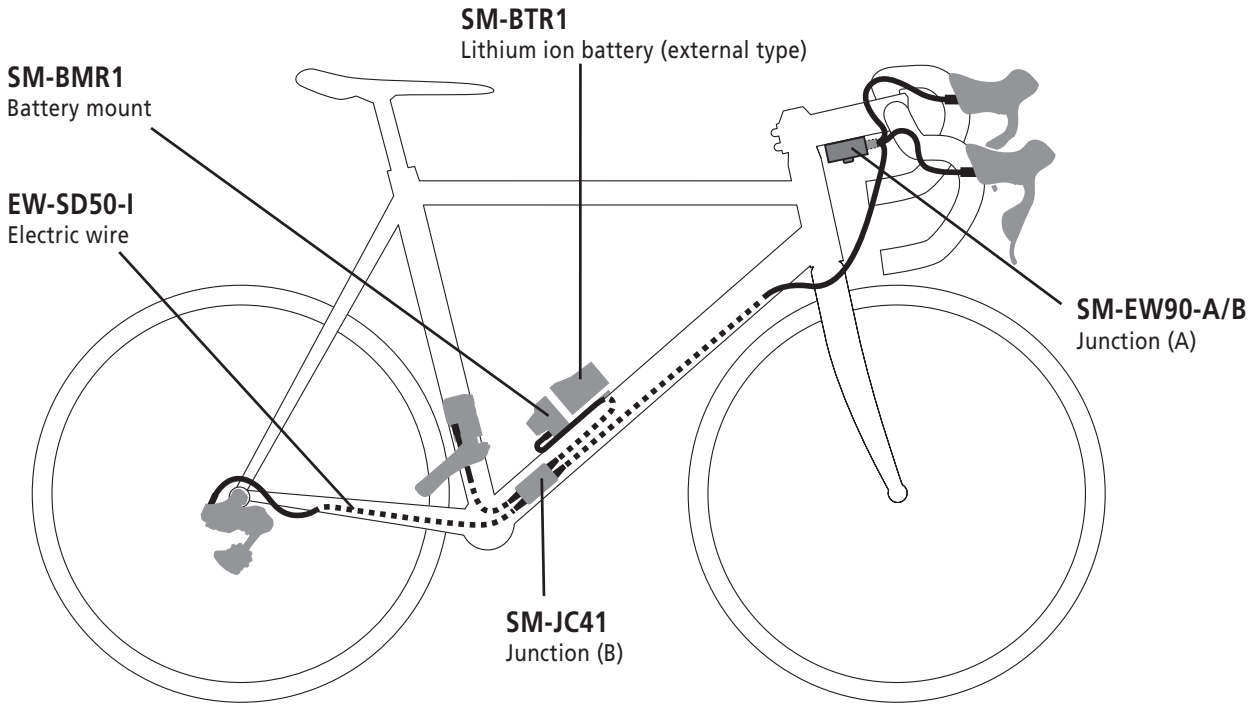
■ Electric wire wiring diagram (overall conceptual diagram)

Lithium ion battery (external type) SM-BTR1

< External type (SM-JC40) >

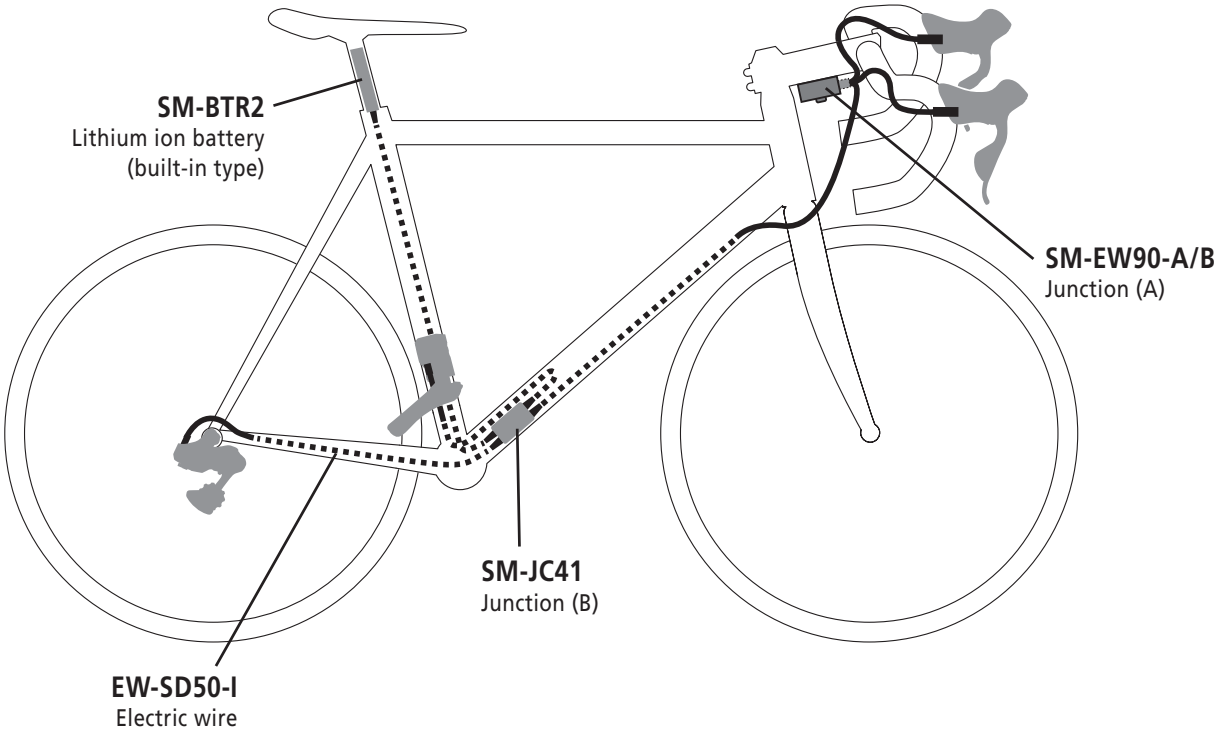


< Built-in type (SM-JC41) >



Lithium ion battery (built-in type) SM-BTR2

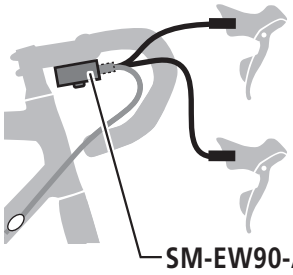
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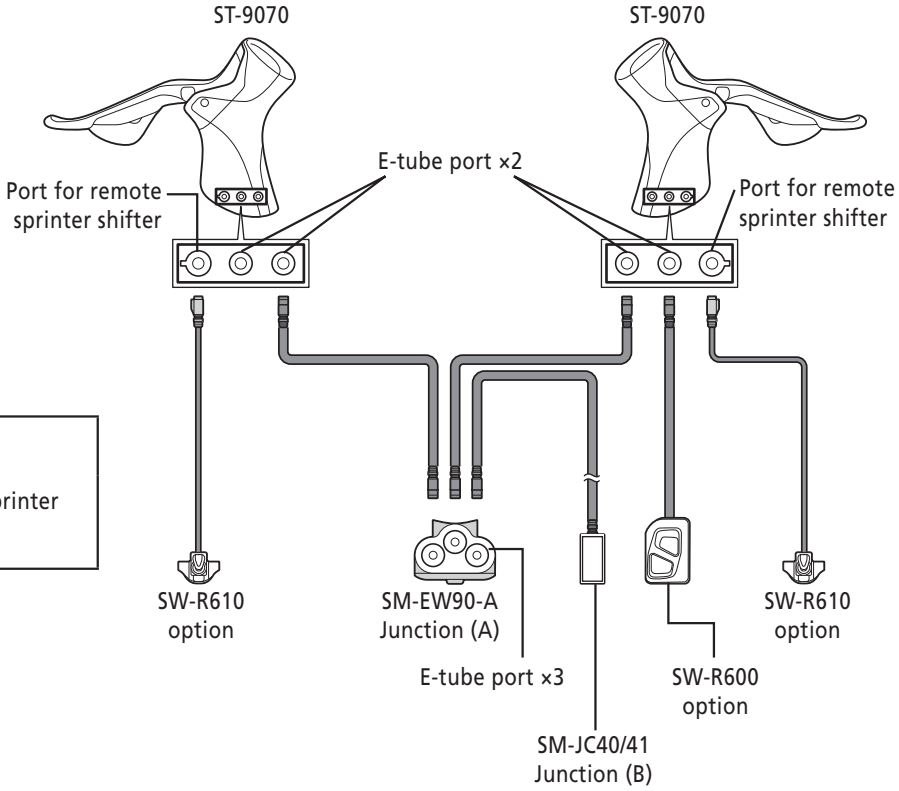


■ Electric wire wiring diagram (junction (A) side)

3 port type

< Drop handle type >

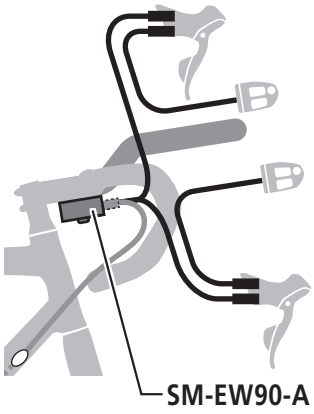


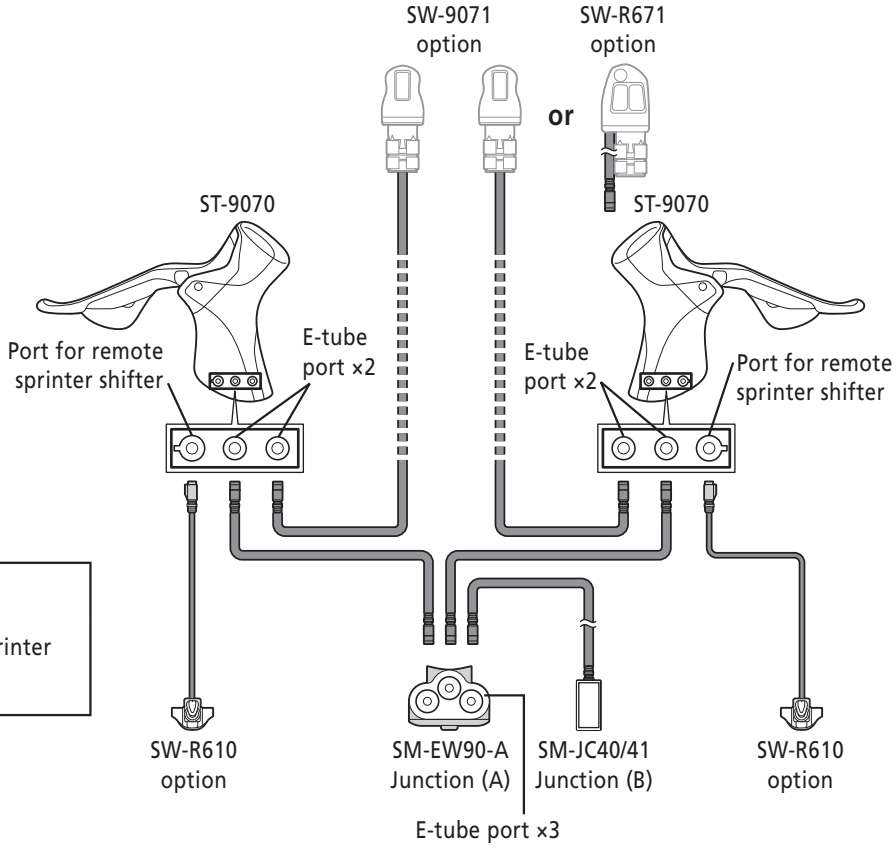


E-tube connector

Connector for remote sprinter shifter

< Clip-on bar type >



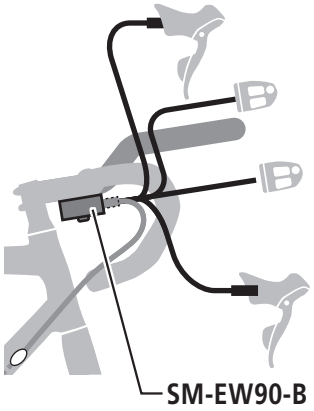


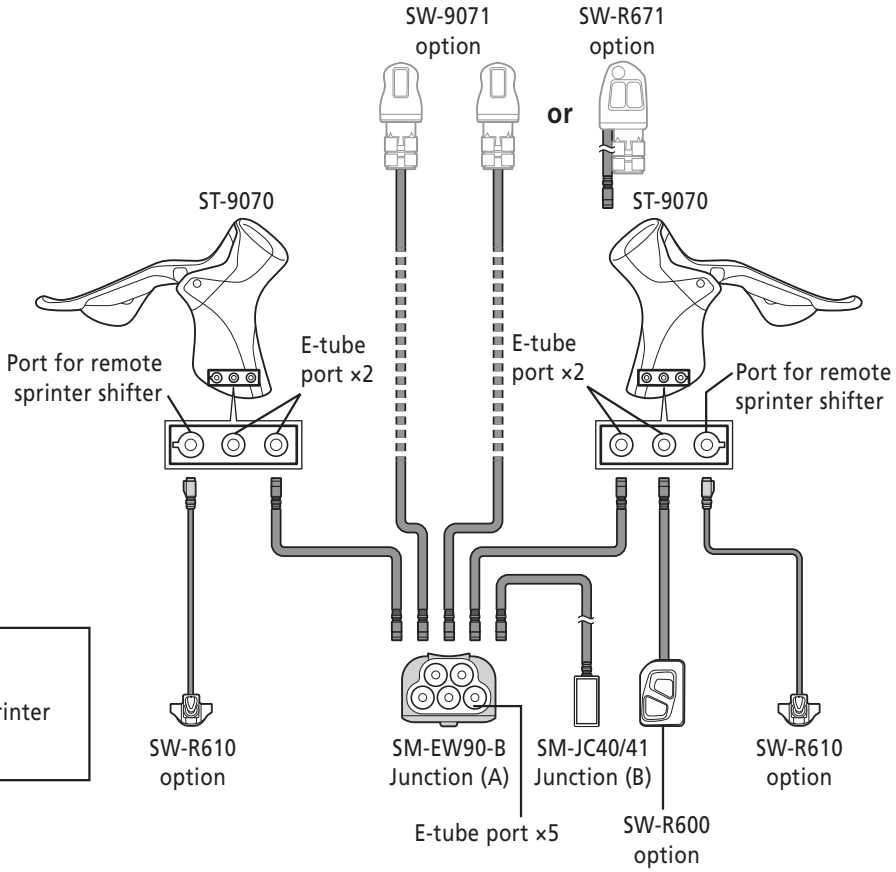
E-tube connector

Connector for remote sprinter shifter

5 port type

< Clip-on bar type >

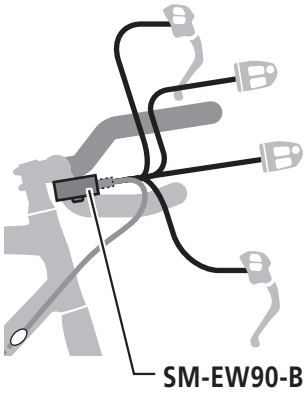


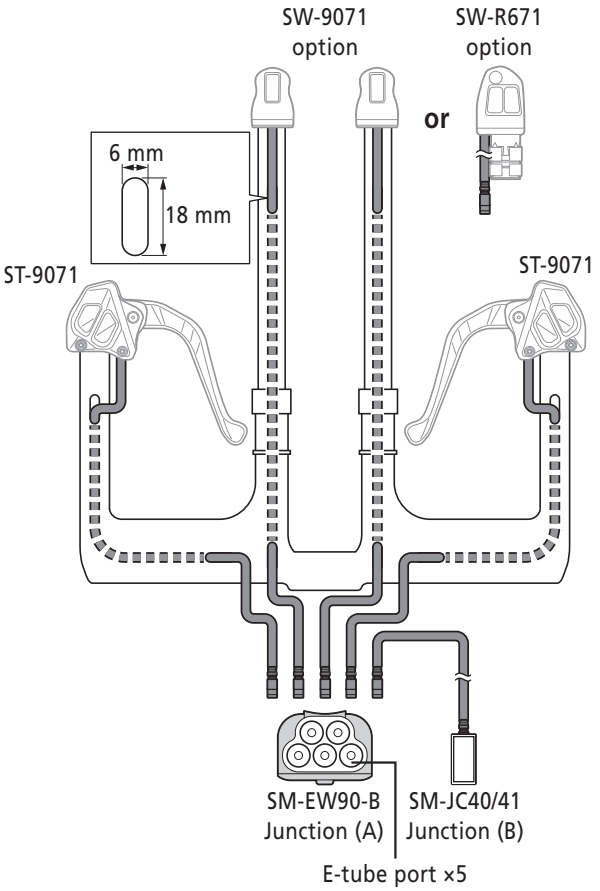


E-tube connector

Connector for remote sprinter shifter

< Time trial / Triathlon handle type >





E-tube connector

Connector for remote sprinter shifter

When installing the components to carbon frame/handle bar surfaces, verify with the manufacturer of the carbon frame/parts for their recommendation on tightening torque in order to prevent over tightening that can cause damage to the carbon material and/or under tightening that can cause lack of fixing strength for the components.

■ Installation of the dual control lever

List of tools to be used

The following tools are required to assemble the product.

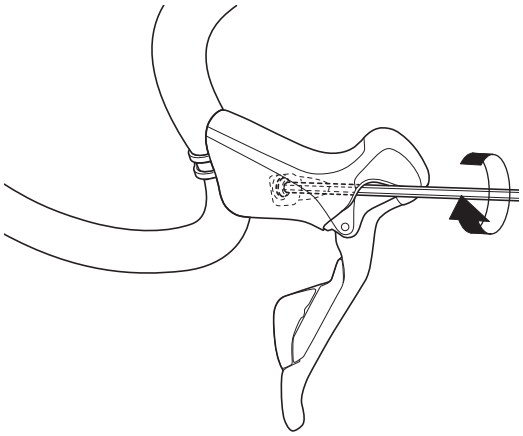
< ST-9070 / ST-9071 >

Where to use	Tool
Clamp nut	5 mm Allen key
Cable cutter	TL-CT12

ST-9070

1. Use a 5 mm Allen key to tighten the clamp nut.

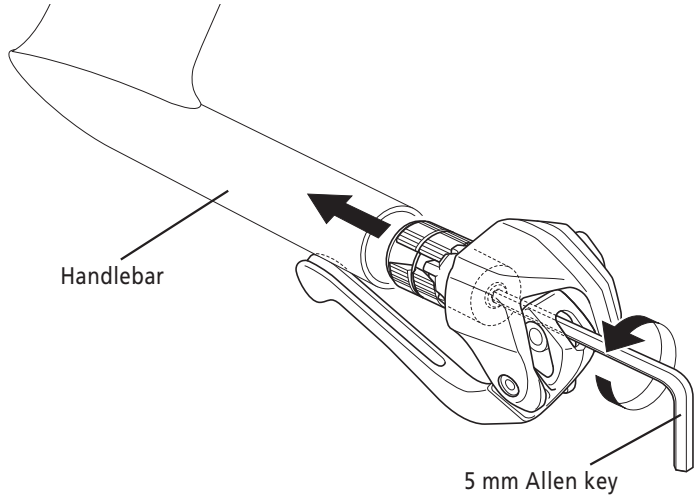
Tightening torque:
6.0 – 8.0 N·m {52 – 70 in. lbs.}



Note:

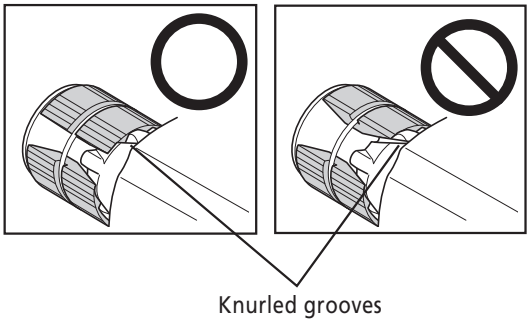
The clamp band, clamp bolt, and clamp nut of ST-9070 have no compatibility with other products. Do not use components that are used in other products together.

Pass the outer casing through the handlebar, and then adjust its length so that it will fit securely into the outer casing holder when the brake lever is installed.
Install the brake lever to the handlebar by using a 5 mm Allen key to turn it counterclockwise as shown in the illustration.



Tightening torque:
6.0 – 8.0 N·m {52 – 70 in. lbs.}

Note:
The knurled grooves should be aligned.



■ Installation of the brake cable

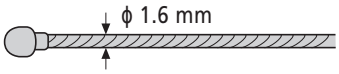
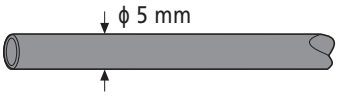
WARNING:

Do not apply grease or other lubricants on the inner cable. When passing the inner cable through an outer casing, if grease adheres on the inner cable fixing section, wipe it off with a cloth before fixing the inner cable. If grease adheres on the fixing section, a sufficient holding force of the brake cable cannot be delivered. This may cause the brake cable to get loose and lose brake control, resulting in severe injury.

Note:

Be careful not let the BC-9000 inner cable come into contact with the brake lever or the metal section (adjustment section) of the caliper brake. When coating is damaged when the inner cable is installed or while the bicycle is used, the coating may become fluffy; however, it will not affect the function.

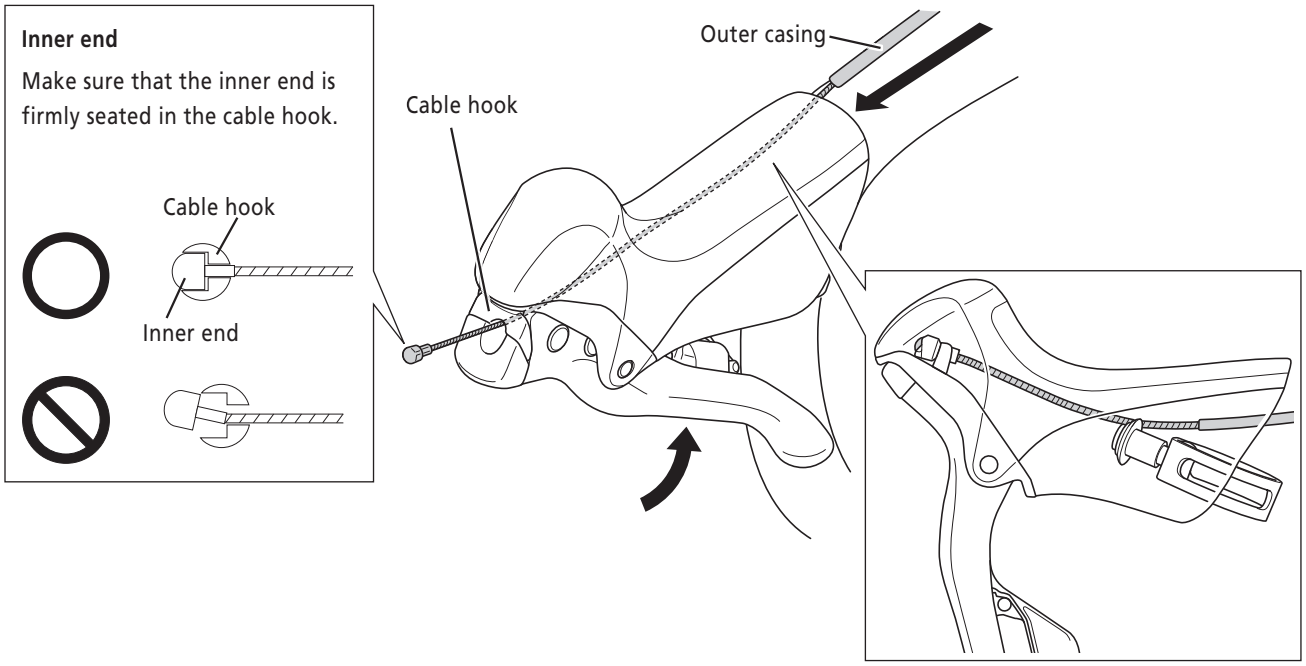
Use cables which are long enough so that they still have some slack even when the handlebars are turned as far as they will go to the left and to the right.

BC-9000 Inner cable	Outer casing
	

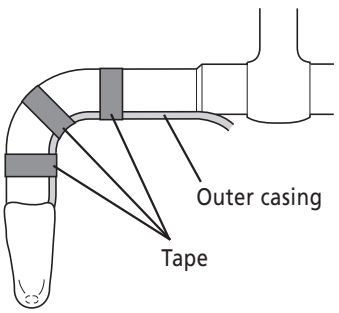
* For information on how to install the brake cable, refer to BR-9000 dealer's manual.

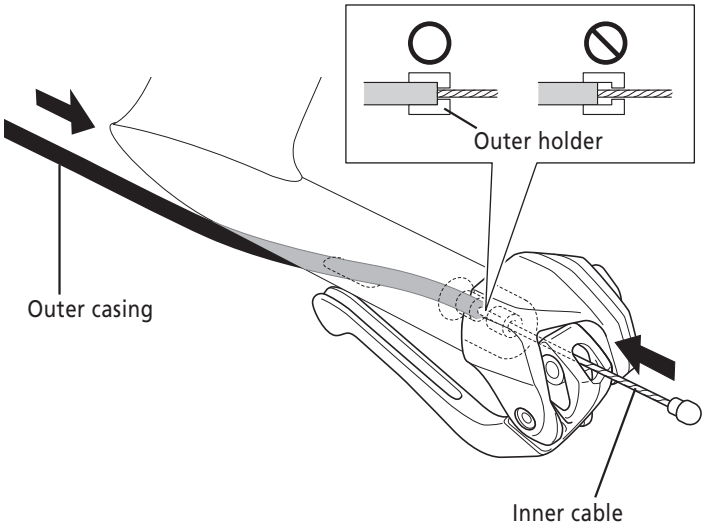
Move the lever in the direction of brake operation and put the brake cable through.

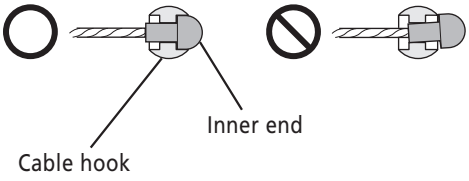
ST-9070



Temporarily secure the outer casing to the handlebar (by using tape or similar material).







Make sure that the inner end is firmly seated in the cable hook.

■ Installation of the front derailleur

List of tools to be used

The following tools are required to assemble the product.

< FD-9070 >

	Where to use	Tool
Front derailleur	Clamp bolt	5 mm Allen key
	Support bolt	2 mm Allen key
	Low / Top adjustment screw	2 mm Allen key

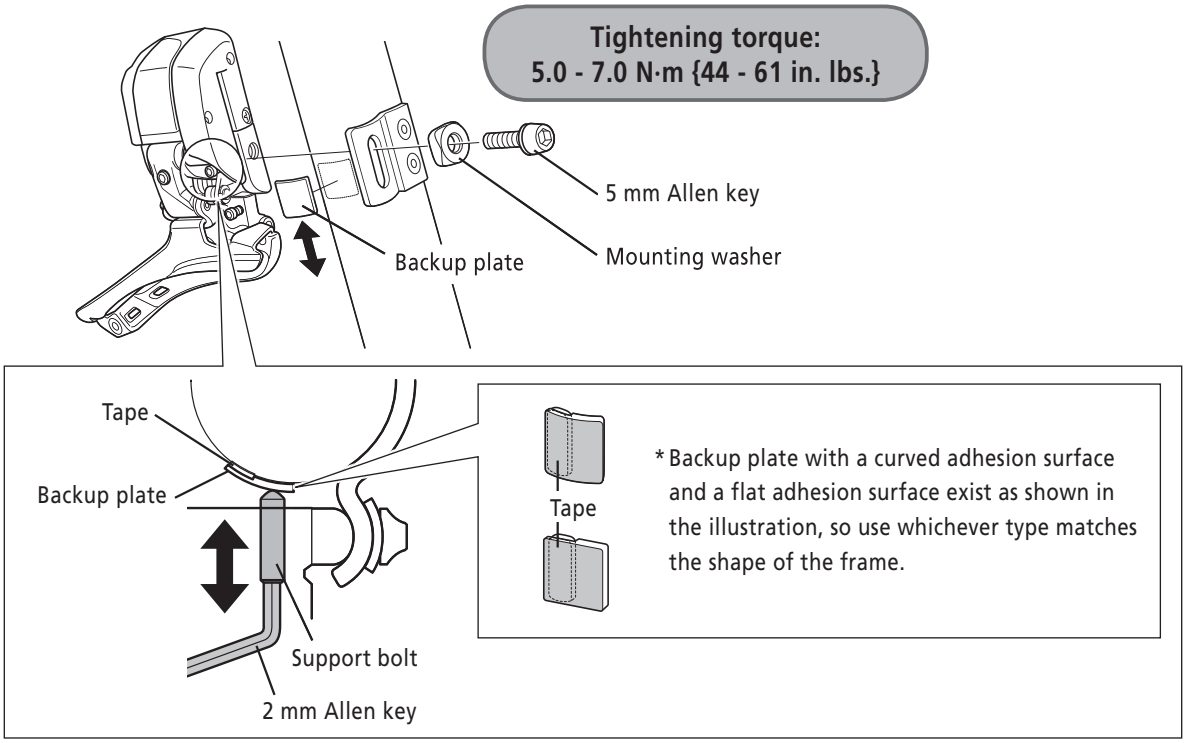
1. Install the front derailleur to the frame.

When installing on a direct mount type frame

When installing the front derailleur on a direct mount type frame, a backup plate needs to be attached to the seat tube. Be sure to attach it to prevent the frame from being damaged by pressure from the support bolt.

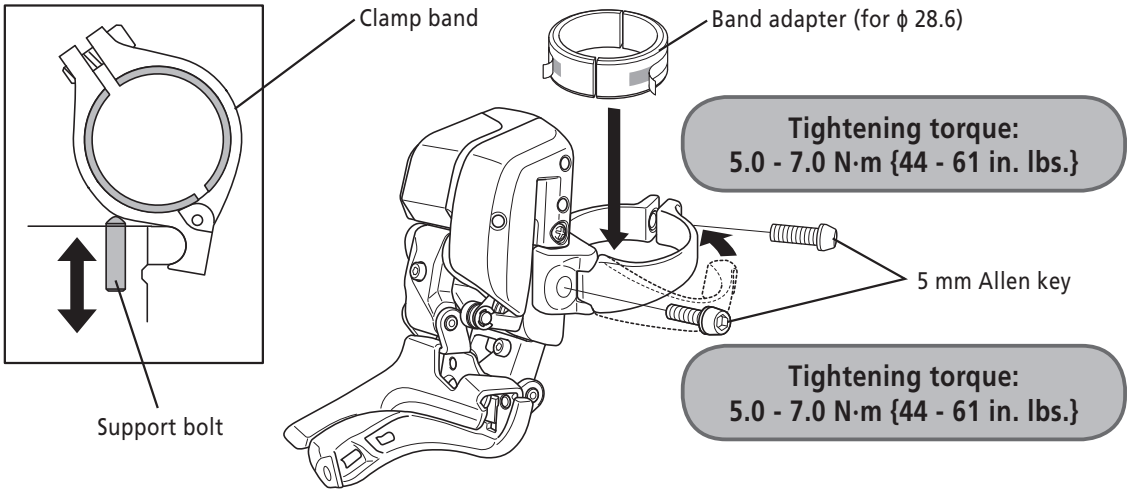
Installation of the backup plate

Check the position where the support bolt directly touches the frame when the support bolt of the front derailleur is being adjusted, and attach the backup plate in that position. In addition, avoid positioning the tape that attaches the backup plate to the seat tube in the location where the support bolt directly touches the frame.

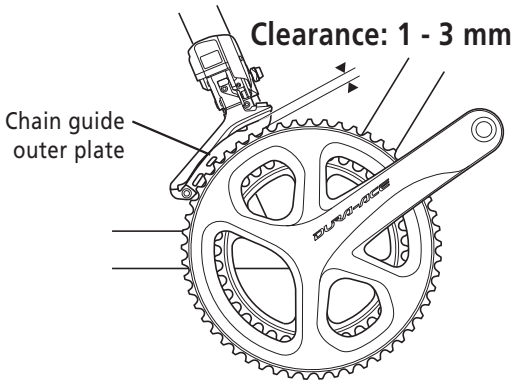


When installing on a band-type frame

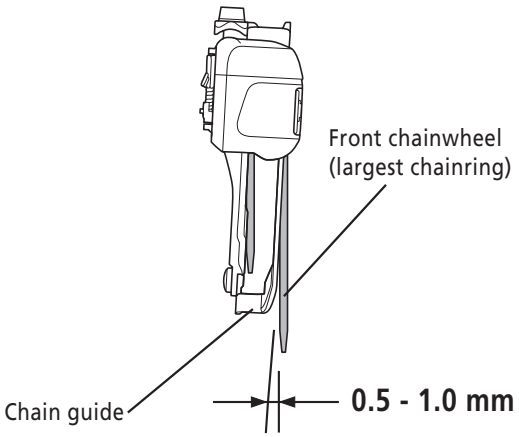
For installation on a band-type frame, the clamp band (SM-AD90/79/67) is required. Apply the support bolt in this case as well. The backup plate and mounting spacer are not required.
* The SM-AD11/15 cannot be installed.



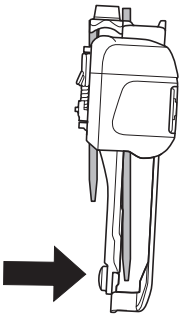
1. Adjust so that there is a clearance of 1 – 3 mm between the chain guide outer plate and the largest chainring.

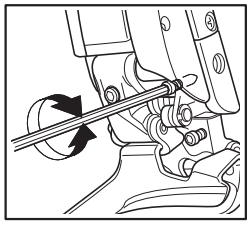


2. Use a 5 mm Allen key to secure the chain guide outer plate so that the flat part of the plate is directly above the largest chainring and so that the rear edge of the chain guide is within 0.5 – 1.0 mm from the front edge of the chain guide.



3. Use a 2 mm Allen key to turn the support bolt in order to adjust the position of the front derailleur so that the flat part of the chain guide outer plate is directly above and parallel to the largest chainring.





■ Installation of the rear derailleur

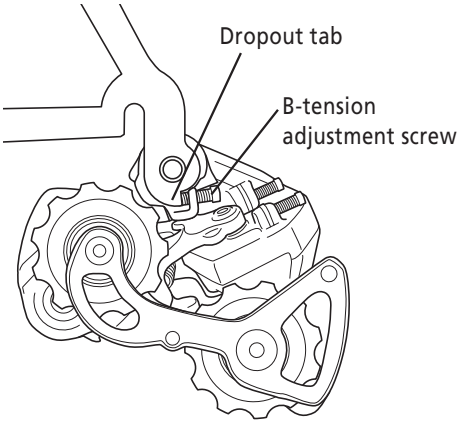
List of tools to be used

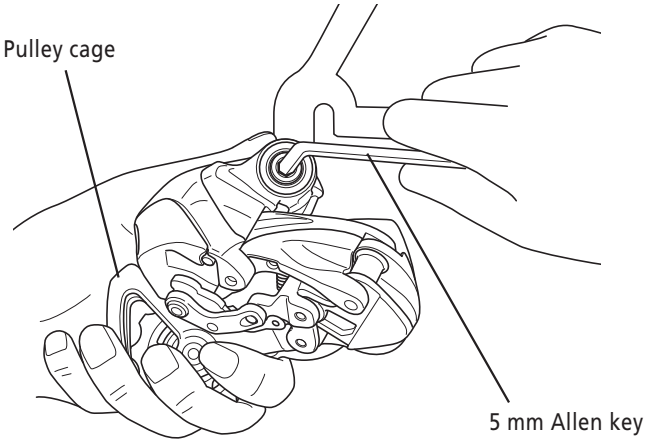
The following tools are required to assemble the product.

< RD-9070 >

	Where to use	Tool
Rear derailleur	Bracket axle	5 mm Allen key
	Stopper adjustment screw	2 mm Allen key
	B-tension adjustment screw	Phillips screwdriver(#2)
	Pulley bolt	3 mm Allen key

When installing the rear derailleur, make sure that the B-tension adjustment screw does not touch the dropout tab and cause it to bend.





Bracket tightening torque:
8.0 - 10.0 N·m {70 - 87 in. lbs.}

■ Installation of the shifting switch

List of tools to be used

The following tools are required to assemble the product.

< SW-R610 >

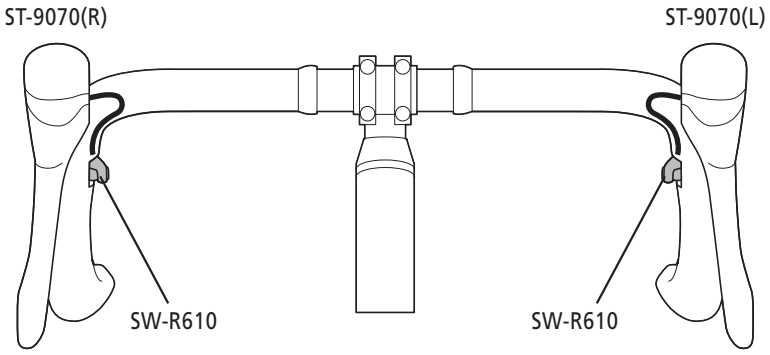
Utility knife	
Handlebar tape cutout tool	Included

< SW-9071 / SW-R671 >

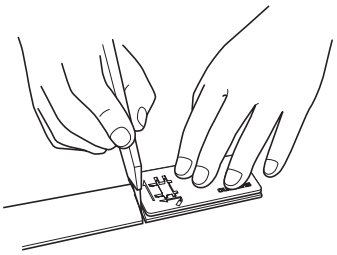
Where to use	Tool
Cover fixing bolt	2.5 mm Allen key
Pull-up bolt	5 mm Allen key

SW-R610 (Sprinter Switch)

Routing Map

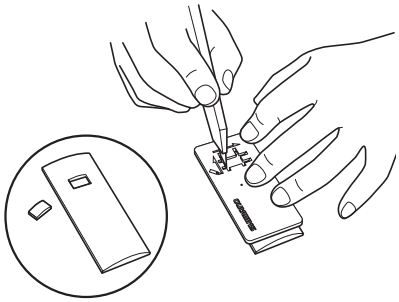


1. Use a cutter knife or similar tool to cut the handlebar tape to the length of the handlebar tape cutout tool as shown in the illustration.

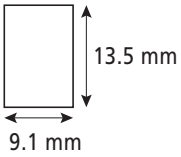


* Make sure that you handle the utility knife safely and correctly in accordance with the instructions which are provided with the utility knife.

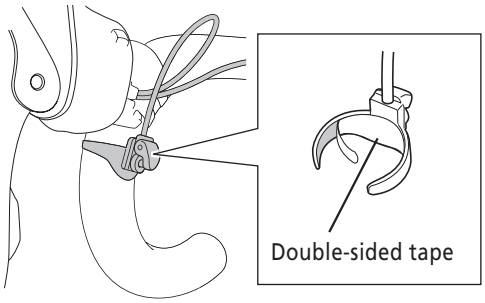
2. Hold the cut handlebar tape against the tool, and then cut out the holes for the switches while following the directions of the arrows on the tool.



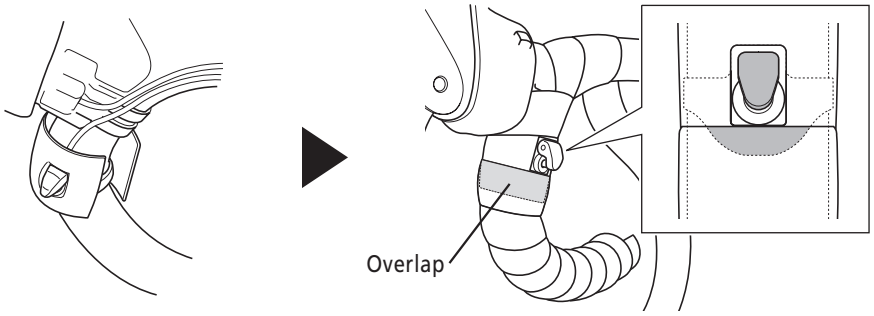
* Depending on the material used for the handlebar tape, it may be difficult to cut the tape using the handlebar tape cutout tool. If this happens, make a hole of the size shown in the illustration.



3. Make guide marks on the handlebars at the switch installation positions, and secure the switches with double-sided tape.



4. Align the holes in the handlebar tape which was cut with the switches, and then wind on the handlebar tape. At this time, be sure to overlap the tape below the switches.



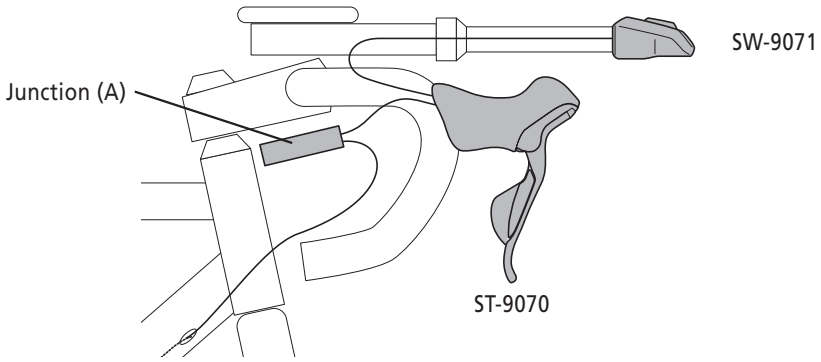
* The illustration shows an example of how to wind the handlebar tape.
* Wind the handlebar tape on securely so that the switches do not move.

Note:

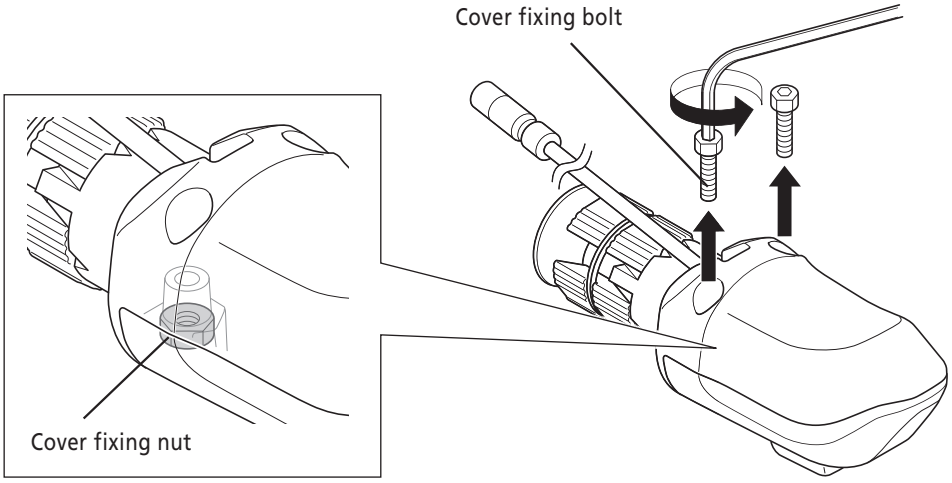
In order to protect the cable, use handlebar tape to secure the cable. Do not secure the cable with the zip tie or the bracket for the cycle computer.

SW-9071 (Shifting switch for aero bar)

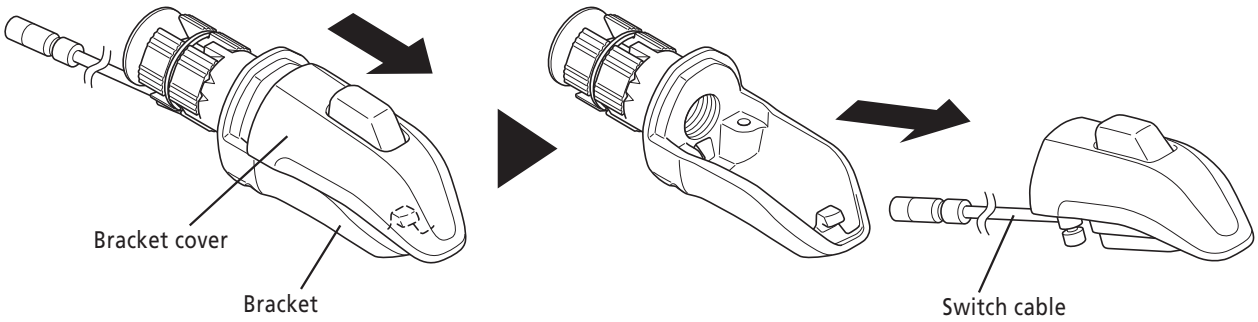
Routing Map



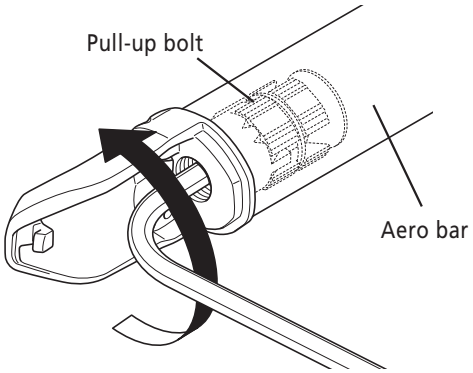
1. Remove two cover fixing bolt (M4) with the 2.5 mm Allen key.



2. Remove the bracket cover from the end of the bracket, disengage the two hooking tabs, and then remove the switch cable from the bracket groove.

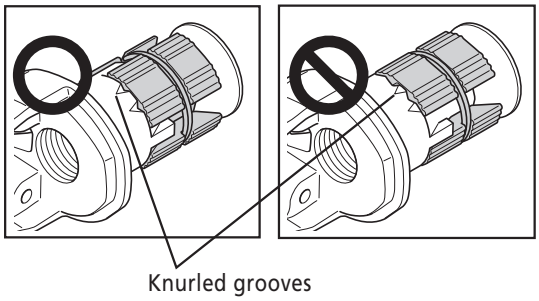


3. Place the bracket onto the end of the aero bar. Adjust the direction of the switch operation surface at this time. Use a 5 mm Allen key to turn the pull-up bolt counterclockwise to tighten it in order to install the bracket to the aero bar.



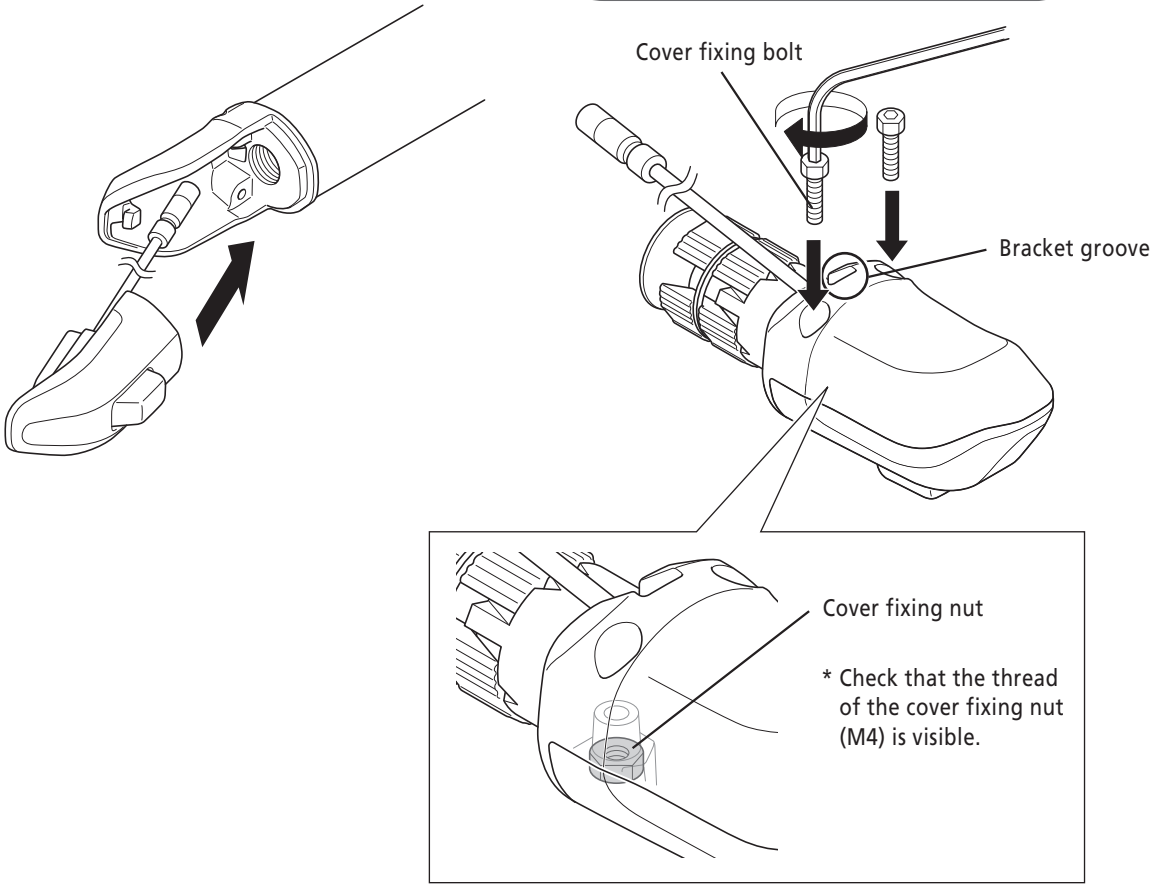
Tightening torque:
5.0 – 6.0 N·m {44 – 52 in. lbs.}

Note:
The knurled grooves should be aligned.



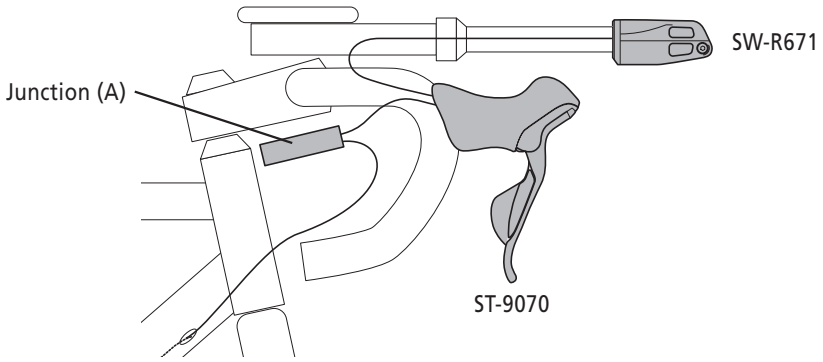
4. Insert the hooking tabs, and then engage the end of the bracket cover to install the bracket. Check that the switch cable is protruding from the bracket groove, and then tighten the cover fixing bolt.

Tightening torque:
1.2 – 1.6 N·m {10 – 14 in. lbs.}

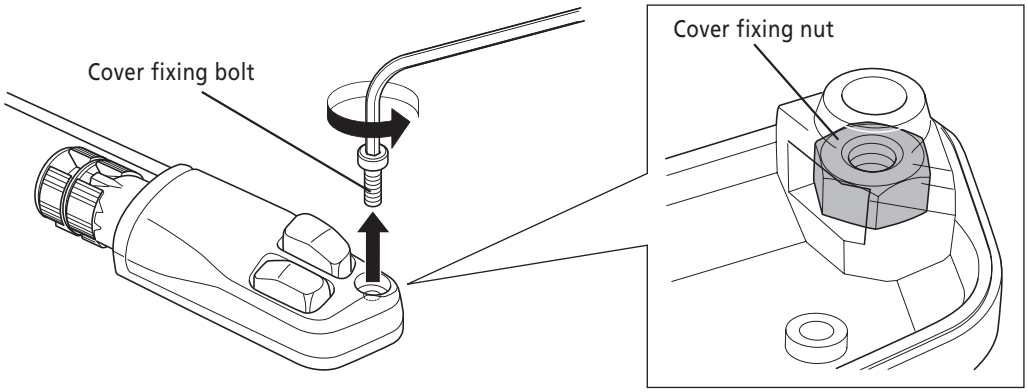


SW-R671 (Shifting switch for aero bar)

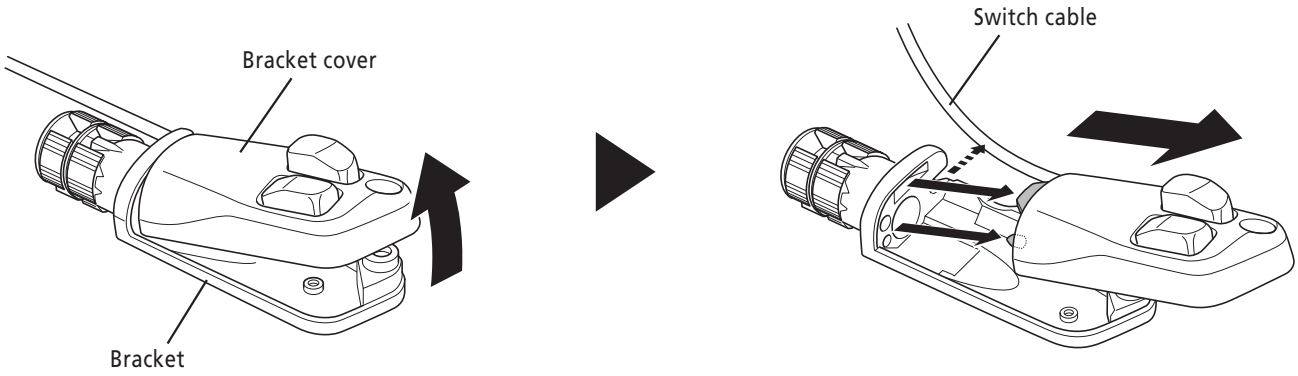
Routing Map



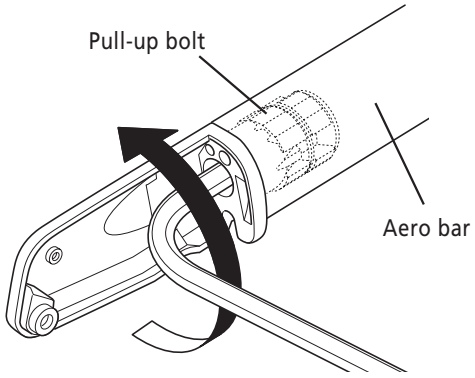
1. Use a 2.5 mm Allen key to remove the cover fixing bolt (M4).



2. Remove the bracket cover from the end of the bracket, disengage the two hooking tabs, and then remove the switch cable from the bracket groove.

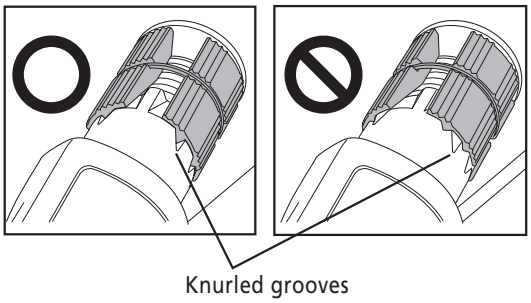


3. Place the bracket onto the end of the aero bar. Adjust the direction of the switch operation surface at this time. Use a 5 mm Allen key to turn the pull-up bolt counterclockwise to tighten it in order to install the bracket to the aero bar.



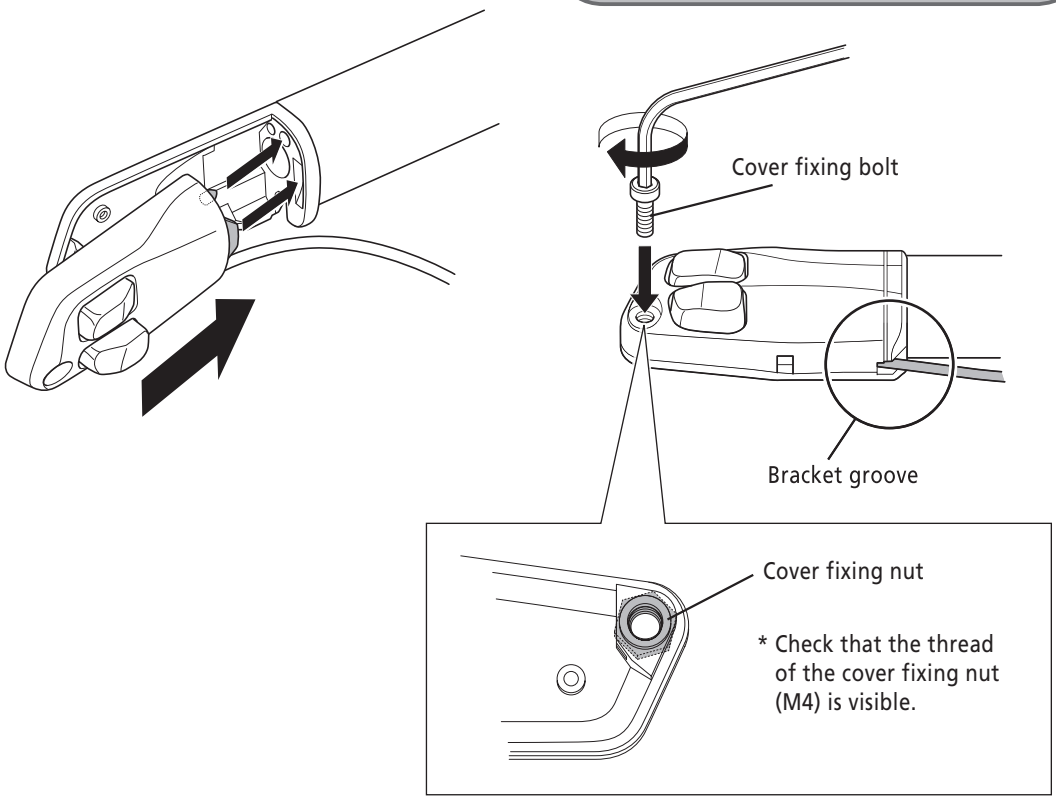
Tightening torque:
5.0 – 6.0 N·m {44 – 52 in. lbs.}

Note:
The knurled grooves should be aligned.



4. Insert the hooking tabs, and then engage the end of the bracket cover to install the bracket. Check that the switch cable is protruding from the bracket groove, and then tighten the cover fixing bolt.

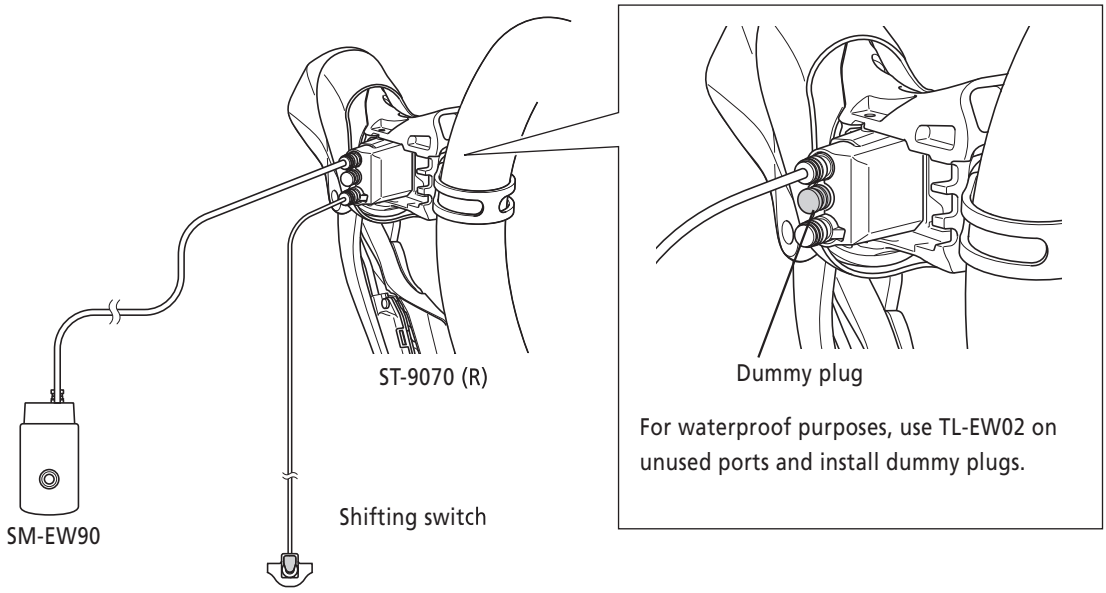
Tightening torque:
1.2 – 1.6 N·m {10 – 14 in. lbs.}



Example of connection of the electric cable

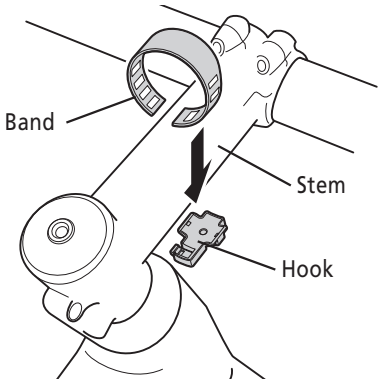
* The illustration shows an example for ST-9070 / SW-R610.

This varies depending on the combination of the dual control lever and the gear-shifting switch.
For details, refer to the electric cable wiring diagram (junction (A)).

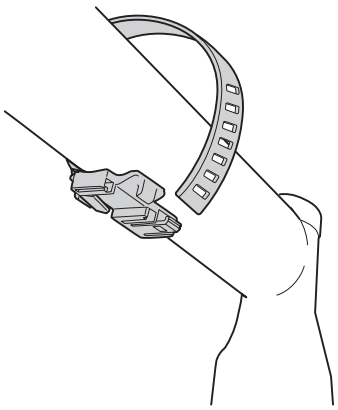


■ Installation of the junction (A)

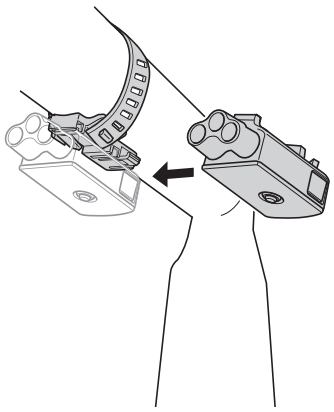
1. Attach to the stem using the band and hook included with SM-EW90.



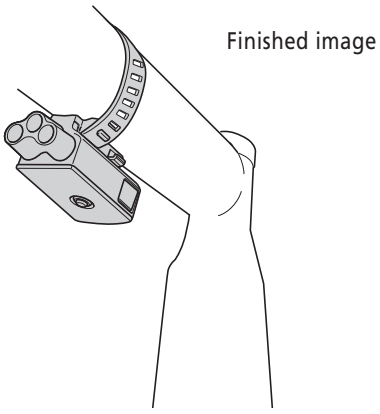
2. Hook the band on the hook and wind it around the stem.



3. Slide SM-EW90 into the rail section of the hook to install it.

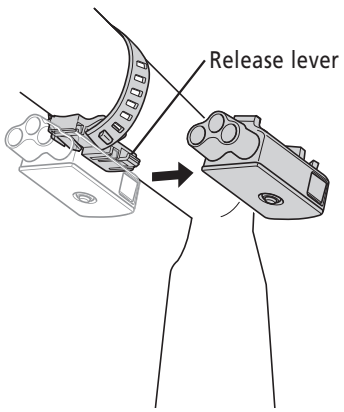


Finished image



Removing of the junction (A)

Pull up the release lever to slide junction (A) in the direction of the arrow for removal. Forcibly pulling up the release lever may break the lever.



■ Installation of the junction (B)

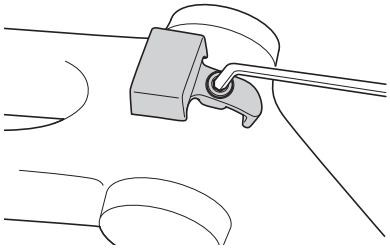
List of tools to be used

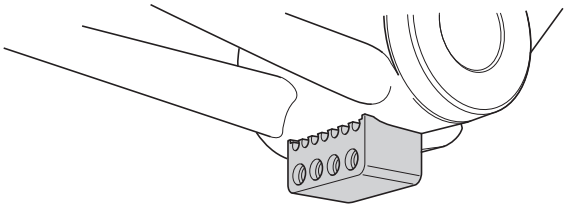
The following tools are required to assemble the product.

Where to use	Tool
Junction (B) fixing bolt	3 mm Allen key

1. Remove the wire guide from the frame, if attached.

2. Attach junction (B) using the wire guide mounting hole.





Finished image

■ Installation of the battery

List of tools to be used

The following tools are required to assemble the product.

< Battery mount >

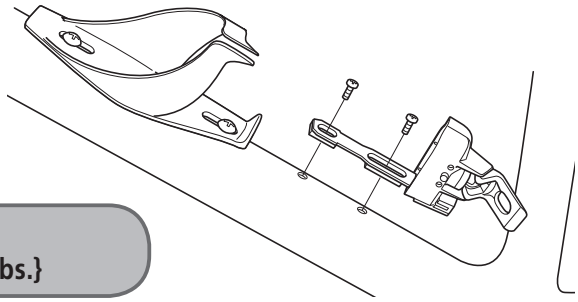
Where to use	Tool
Battery mount fixing bolt	2.5 mm Allen key

In the case of an external battery (SM-BTR1)

Installation of the battery mount

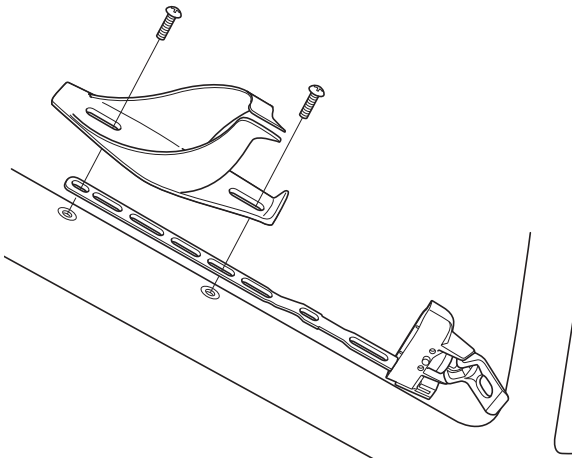
1. Set the battery mount into position. Use the bottle cage fixing bolt to provisionally install the battery mount to the bottom of the bottle cage.

Use the included M4 bolts to secure the short type.

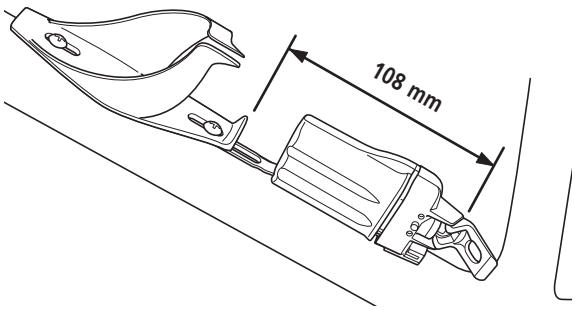


Tightening torque:
1.2 - 1.5 N·m {10 - 13 in. lbs.}

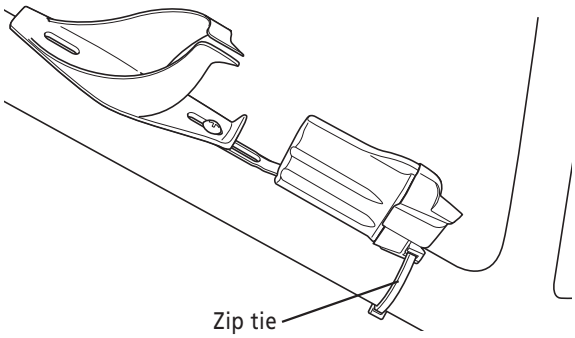
For the long type, secure it with the bolts supplied with the frame or the bottle cage.
Refer to the Service Instructions for the bottle cage for details on the tightening torques.



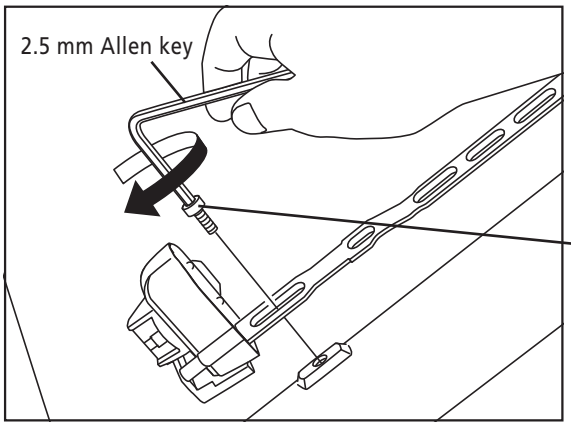
2. Leave a space of 108 mm or more at the end of the battery mount. Check that the battery can be inserted and removed while the bottle cage is installed.



3. Tighten the bolt of the bottle cage to secure the battery mount. For the long type, use the accessory zip tie to secure the battery mount to the frame.



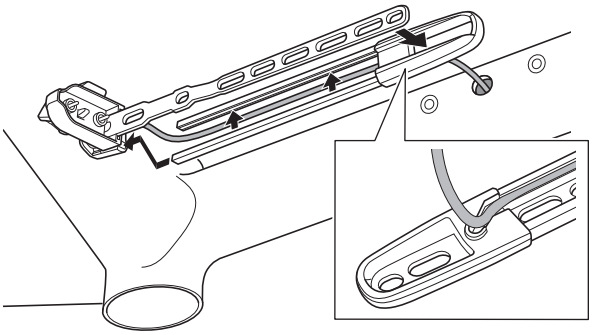
* If there is a mounting boss on the frame, the battery mount can be secured to the frame with a bolt.



Tightening torque:
1.2 - 1.5 N·m {10 - 13 in. lbs.}

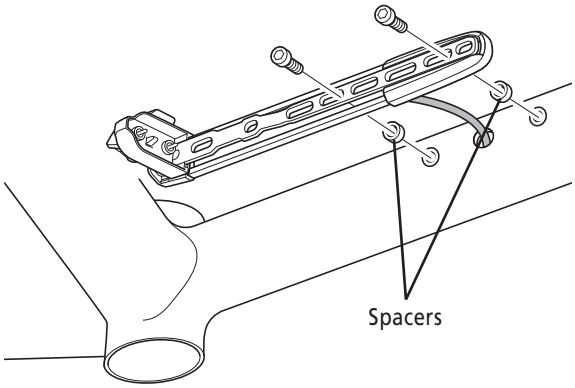
Installation of the battery cable cover

1. Set the electric wire for the battery mount into the groove in the electric wire cover for the battery mount.

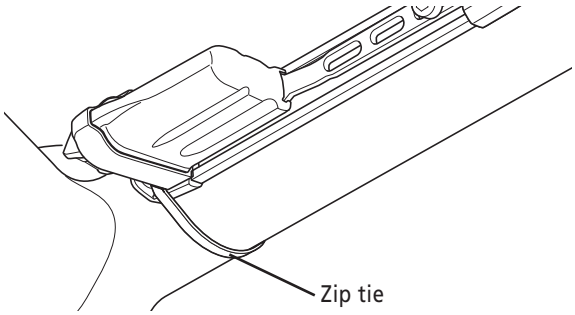


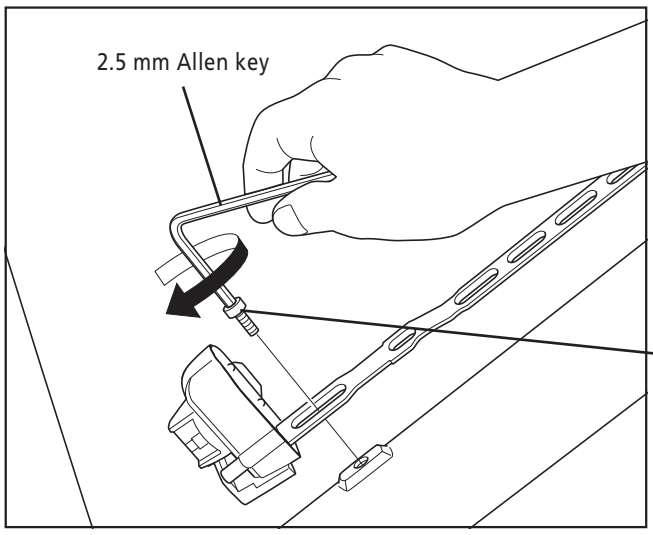
2. Place the accessory spacers in between the battery mount and the frame and then secure them by tightening the bolts.

* If installing the bottle cage, it is easier to install it at this stage.
* Refer to the Service Instructions for the bottle cage for details on the tightening torques.



3. Use the accessory zip tie to secure the battery mount to the frame.





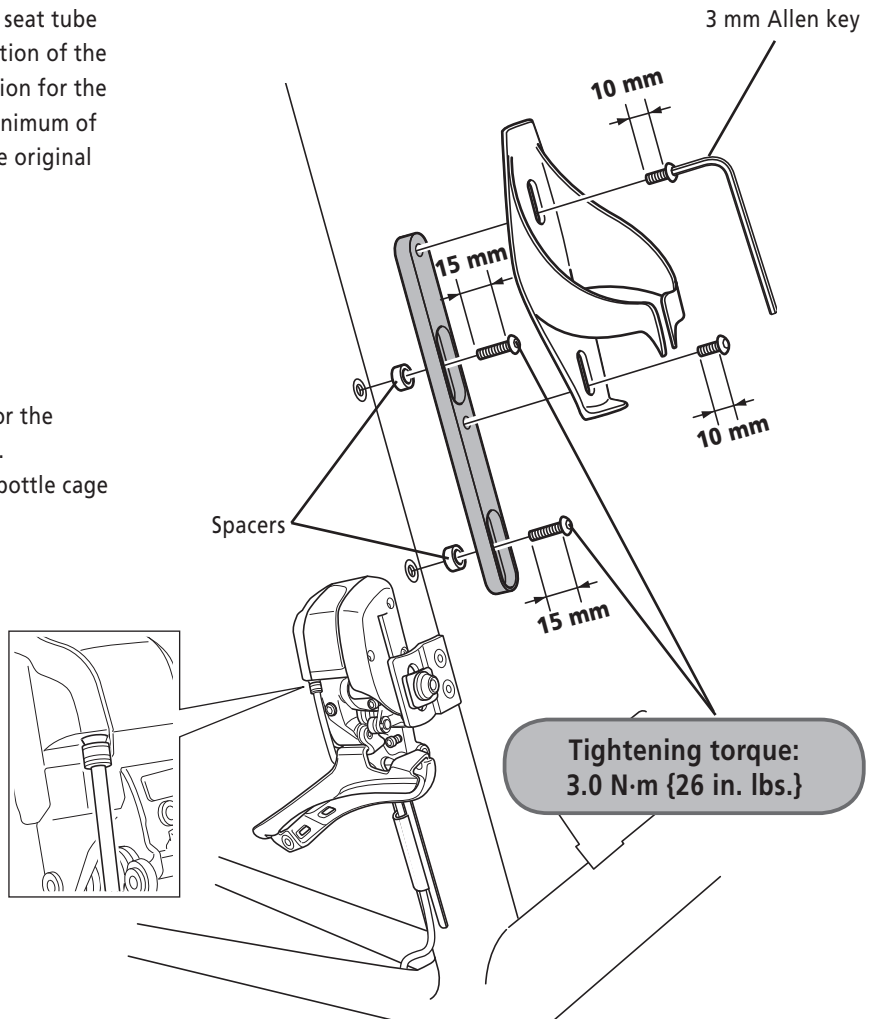
* If there is a mounting boss on the frame, the battery mount can be secured to the frame with a bolt.

Tightening torque:
1.2 - 1.5 N·m {10 - 13 in. lbs.}

Installation of the bottle cage adapter

If the bottle cage which is installed to the seat tube interferes with the battery, move the position of the bottle cage upward. The installation position for the bottle cage can be moved upward by a minimum of 32 mm and a maximum of 50 mm from the original installation position.

* If it interferes with the mounting boss for the front derailleur, use the accessory spacer.
* Refer to the Service Instructions for the bottle cage for details on the tightening torques.



In the case of a built-in battery (SM-BTR2)

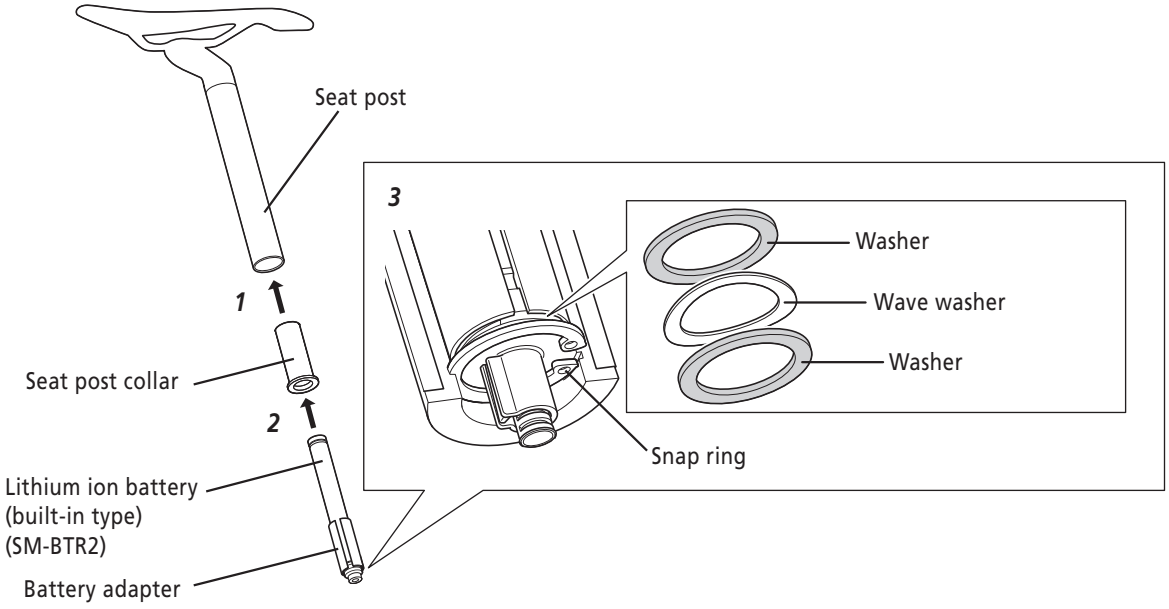
This method is used to secure it on the seat post. Depending on the frame, the way the battery is installed may differ. For details, consult with the manufacturer of completed bicycles.

Installation of the battery (built-in type)

1. Bond seat post collar to inside of seat post.

2. Insert internal battery into the collar from the bottom of seat post.

3. Mount a washer, wave washer, and washer to the groove of the battery adapter, and fix them with a snap ring.



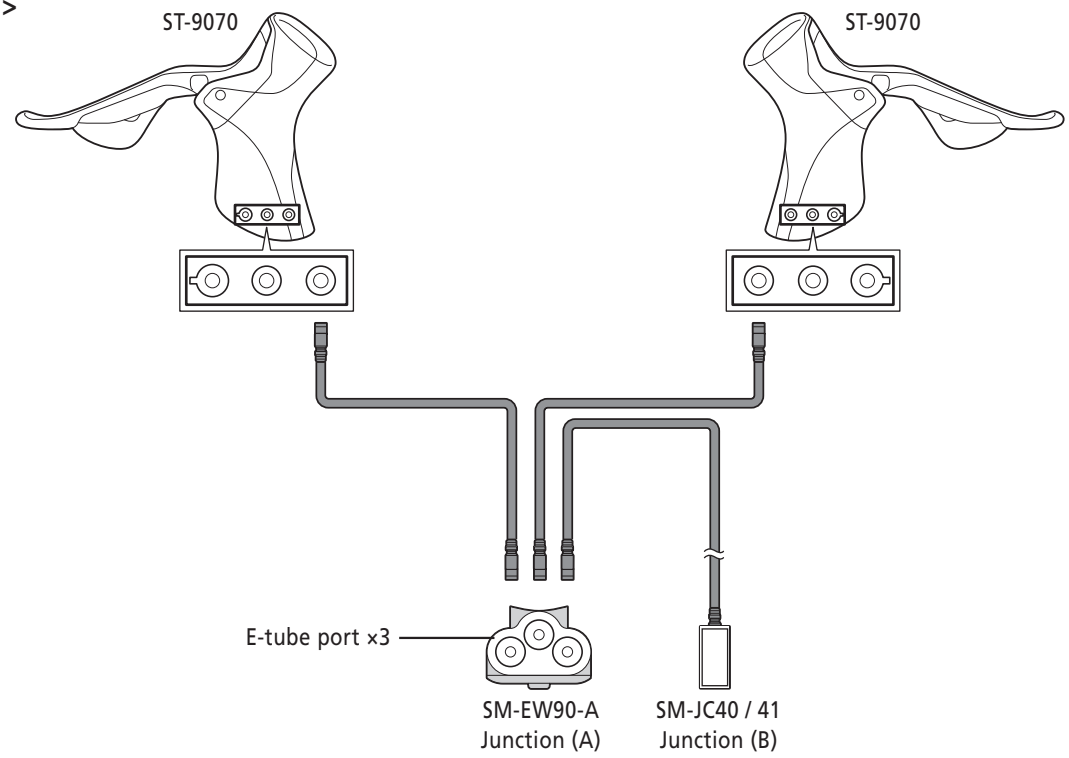
CONNECTION OF THE ELECTRIC WIRE

■ Connection of the junction (A)

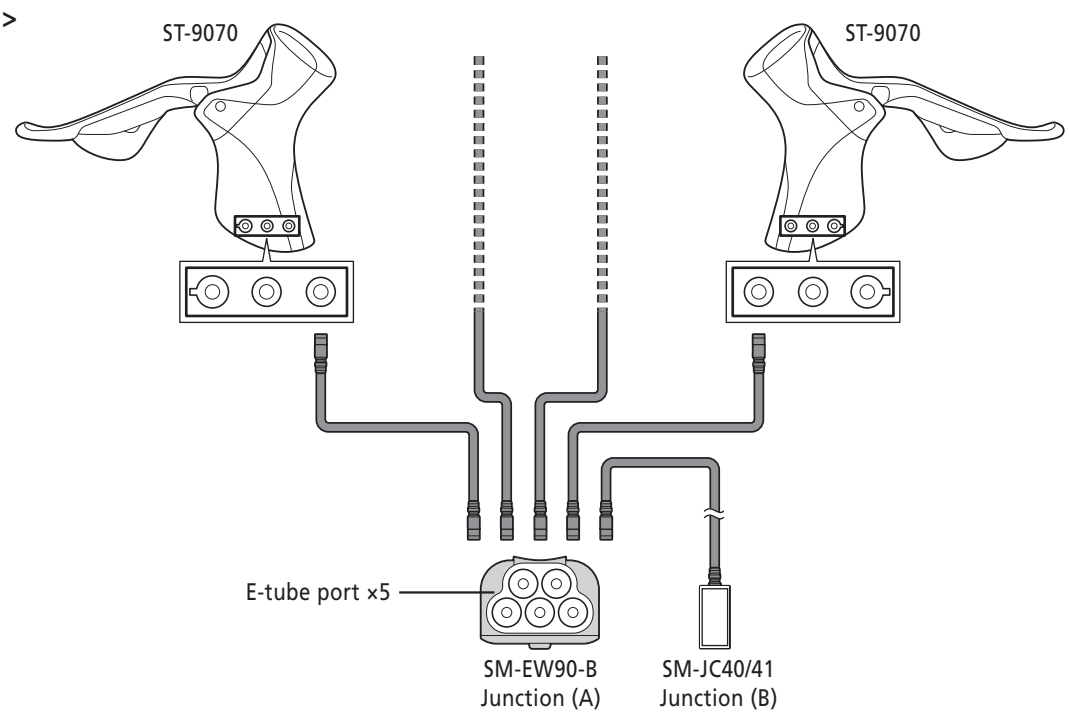
Wire SM-EW90 with a sufficient margin to allow the positioning of ST-9070 and the full turning of the handle. The electric wire can be wound around the handle when the bar tape is wrapped.

ST-9070 with SM-EW90 routing map

< 3 port >

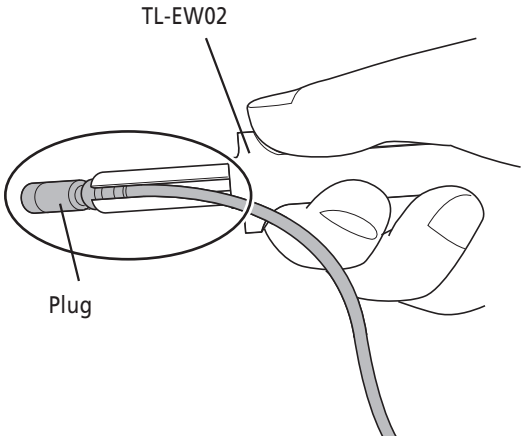


< 5 port >

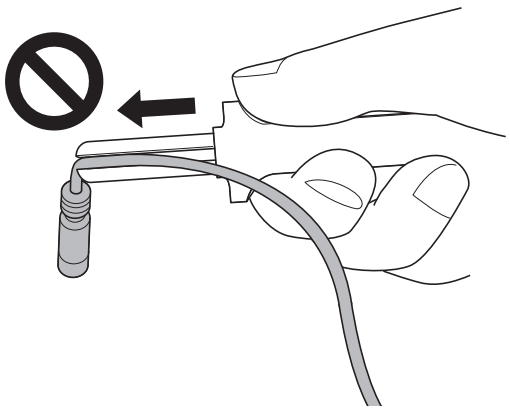


Note:

Use the special tool TL-EW02 for installation and removal of the electric wire.
When installing the electric wire, do not forcibly bend the plug.
It may result in a poor contact.



OK



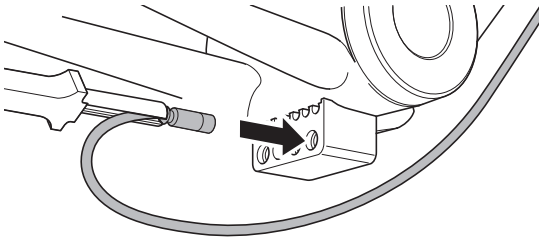
Not OK

■ Connection of the junction (B)

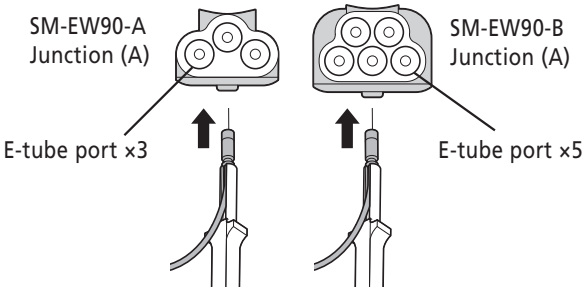
External type (SM-JC40)

When connecting the electric wire, push it in until it clicks in place.

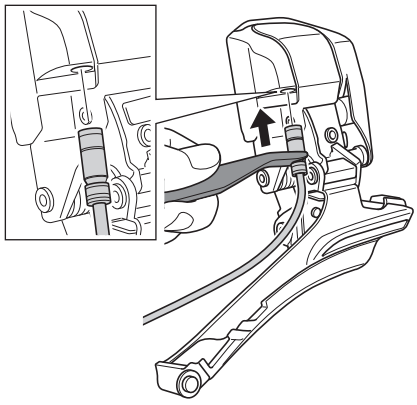
1. Connect the electric wires to junction (A) and junction (B).



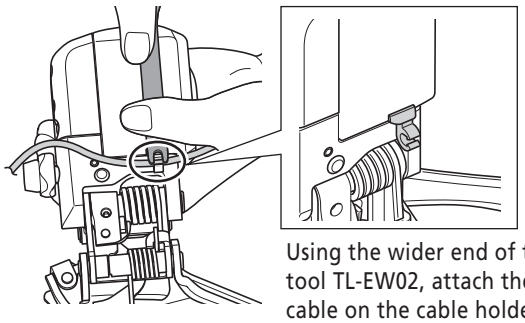
Junction (B)



2. Connect the electric wires to the front derailleur, the rear derailleur and the battery mount.

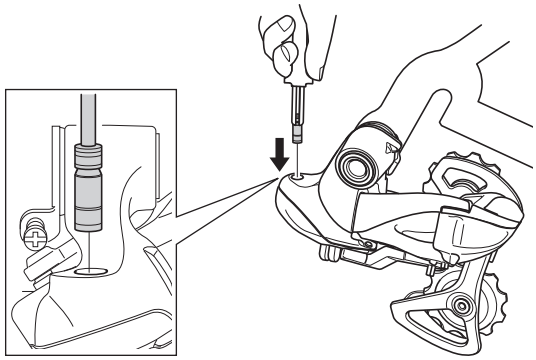


Front derailleur

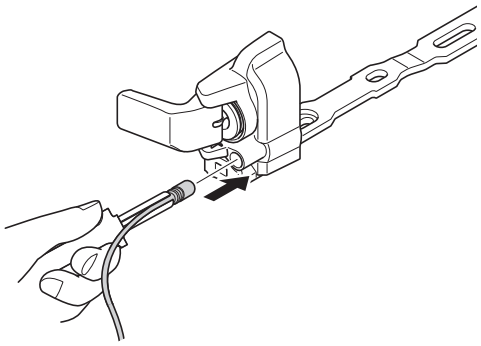


Using the wider end of the special tool TL-EW02, attach the electric cable on the cable holder.

FD-9070 has a cable holder on the back side. After connection, attach the cable as shown in the illustration.
If the electric wire is difficult to attach, remove the rear wheel.



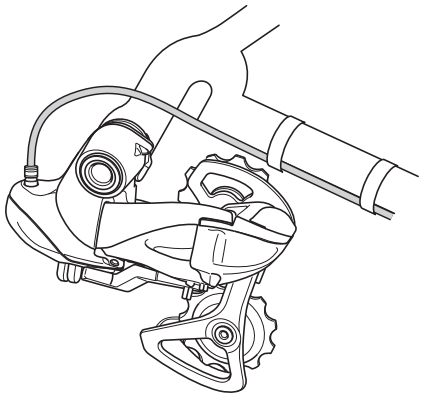
Rear derailleur



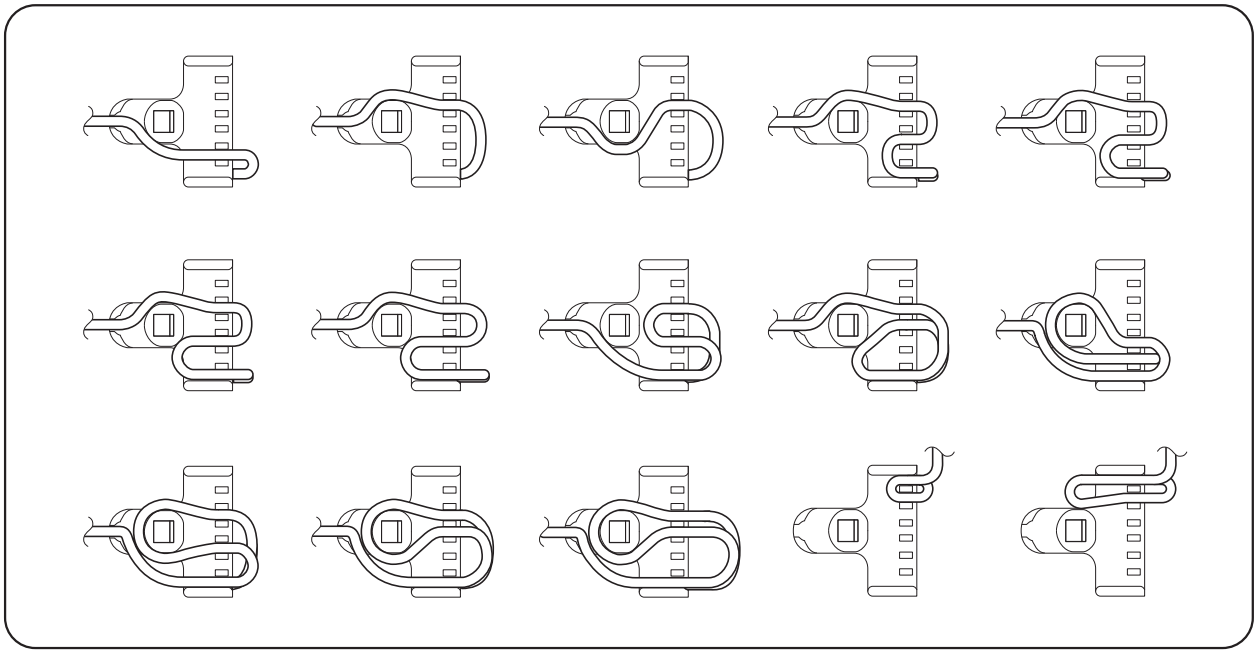
Battery mount

3. Provisionally secure the electric wire along the frame with tape, and then connect it to junction (B).

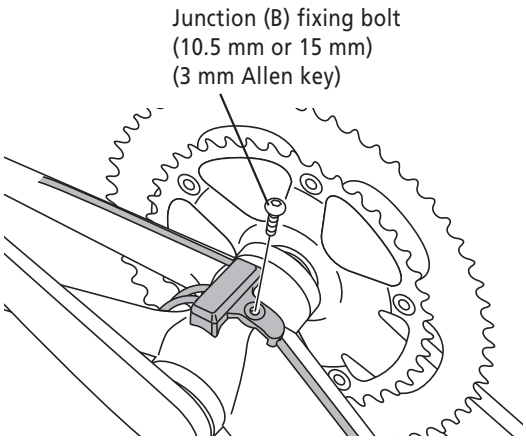
* When routing the electric wire to the rear derailleur, be sure to install it to the bottom of the chainstay to avoid any interference between the cable and the chain.
* Wind any excess length of electric wire inside junction (B) to adjust the length.



Example of adjusting junction (B) length

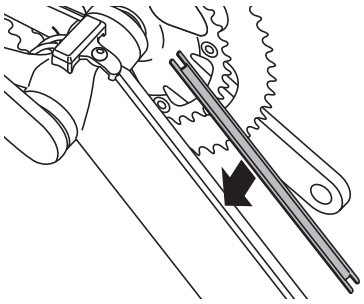


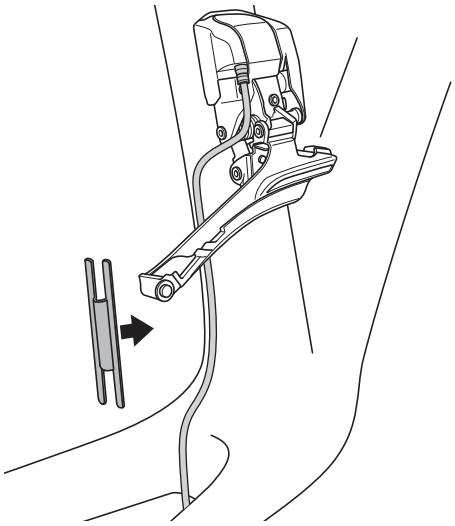
4. Once the electric wires have been routed, secure junction (B) underneath the bottom bracket shell.

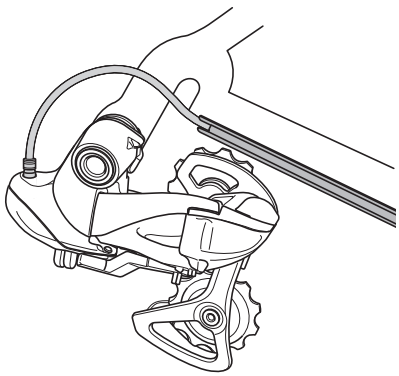


Tightening torque:
1.5 - 2.0 N·m {13 - 17 in. lbs.}

5. Next, install the electric wire cover to the frame.
To ensure adhesion, before installing the electric wire cover, wipe off the grease on the frame with alcohol or a cleaner.
Place the electric wire cover over the electric wires, and then attach it to the frame.



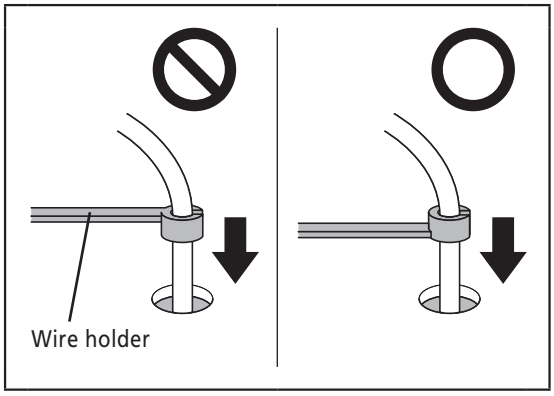




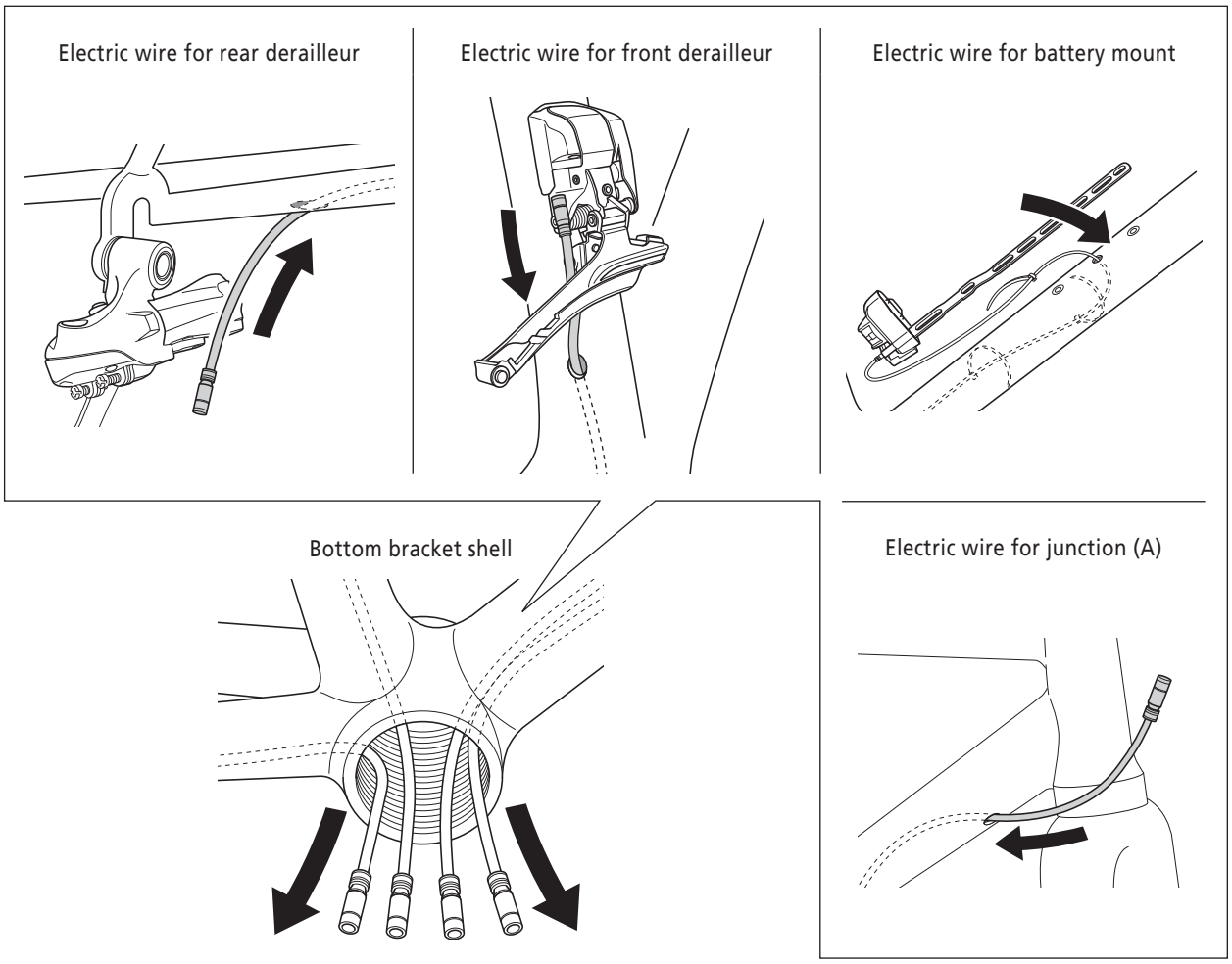
Built-in type (SM-JC41)

1. First pass the electric wires for junction (A), the battery mount, the front derailleur and the rear derailleur through the holes in the frame into the bottom bracket shell.

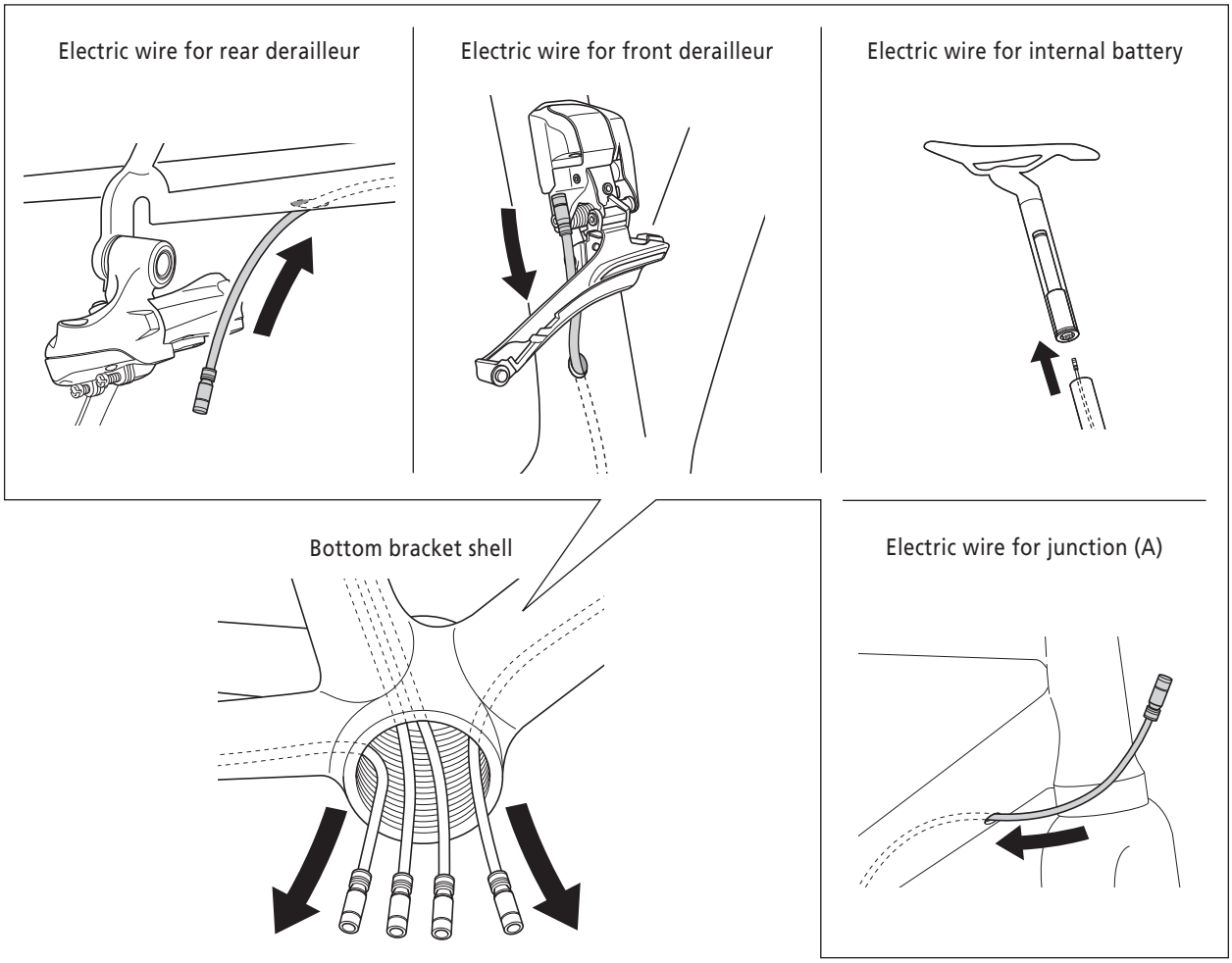
* The electric wires for built-in use can be inserted only in one direction.



< In the case of an external battery (SM-BTR1) >

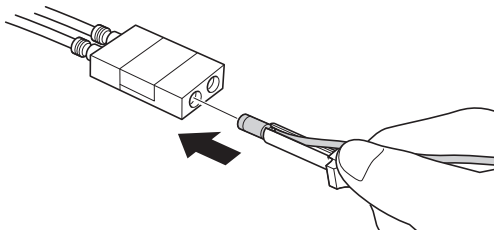


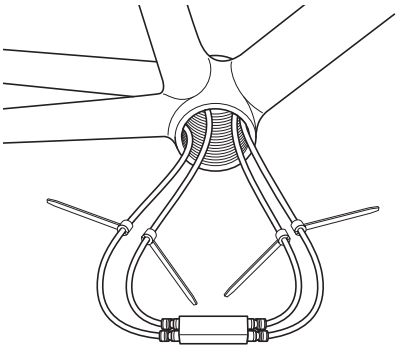
< In the case of a built-in battery (SM-BTR2) >



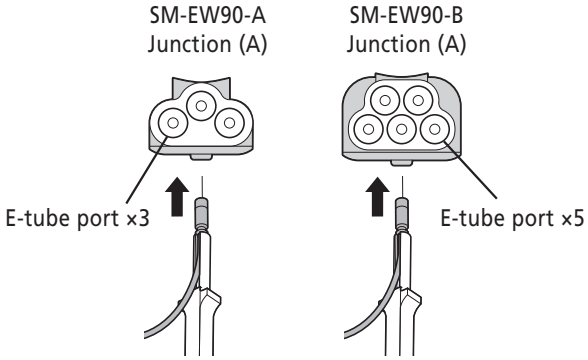
2. Connect each electric wire to junction (B).

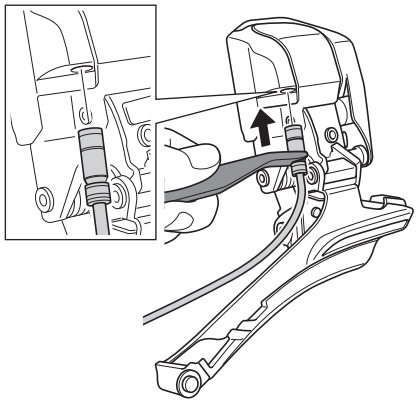
When connecting the electric wire, push it in until it clicks in place.



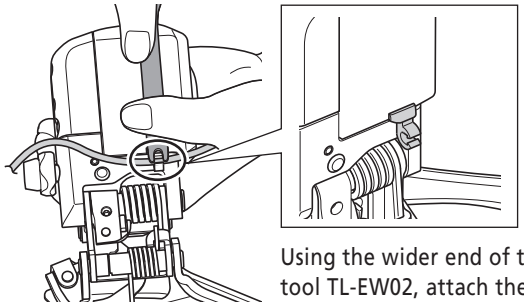


3. Connect the electric wire to junction (A), the front derailleur, the rear derailleur, and the battery mount.



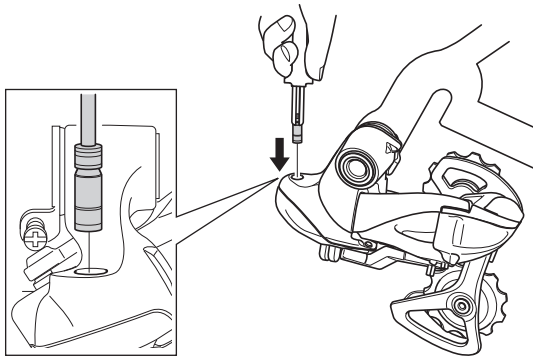


Front derailleur

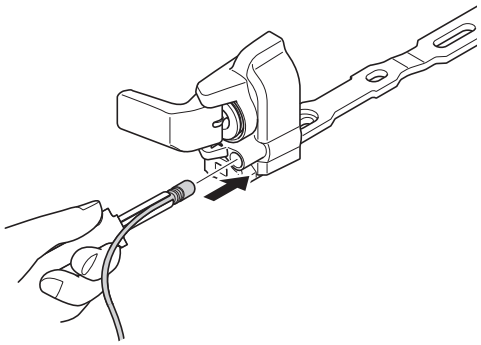


Using the wider end of the special tool TL-EW02, attach the electric cable on the cable holder.

FD-9070 has a cable holder on the back side. After connection, attach the cable as shown in the illustration.
If the electric wire is difficult to attach, remove the rear wheel.



Rear derailleur

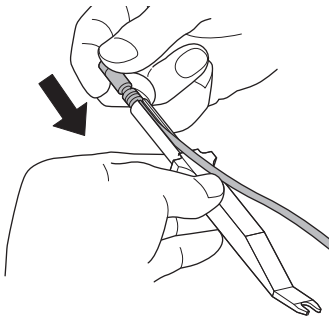


Battery mount

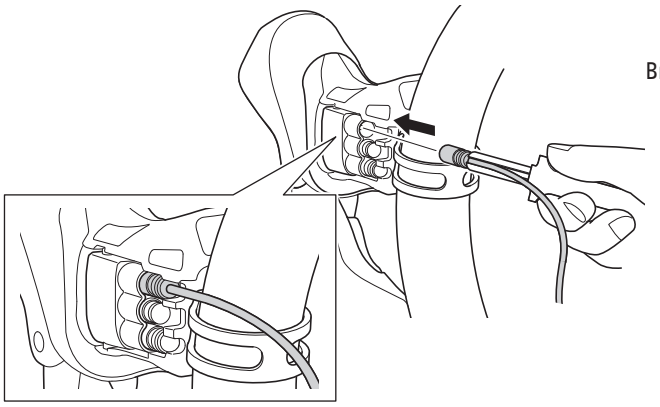
■ Connection to the Dual control lever

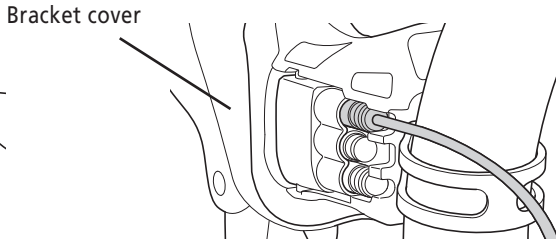
< ST-9070 >

1. Use the TL-EW02 special tool to connect to the ST-9070. Set so that the projection on the connector is aligned with the groove on the narrow end.



2. Open up the bracket cover and lift up the connector cover.
Use the TL-EW02 to connect the connector of the electric wire to the terminal on the lever side. Be sure to push them together until they connect with a click. Either the top or bottom terminal can be used.

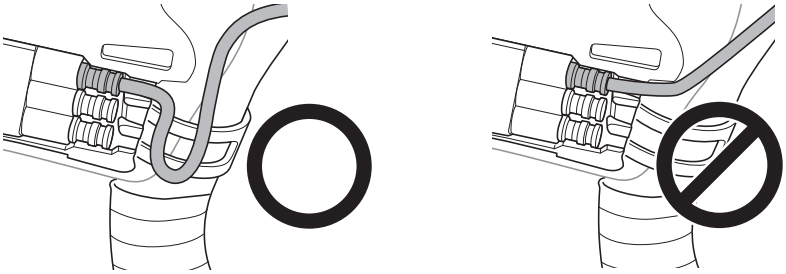




* The remaining terminal can be used for an additional satellite switch or the SM-PCE1.

Note:

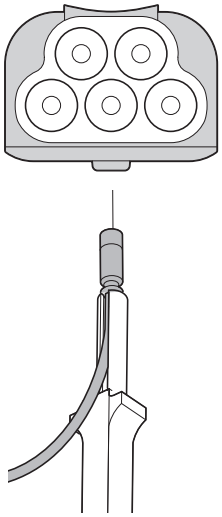
- When the handle is gripped or the bar tape is wound, the electric wires may be pulled out. By allowing sufficient wire length, accidental connector disconnection can be prevented after winding the bar tape.
- This length margin of electric wire is also necessary to open the bracket cover when additional switch and the SM-PCE1 is connected.



< ST-9071/SW-9071/SW-R671/SW-R610 >

1. For the following models, attach the electric cable (fitted type) of the product to junction (A).
SW-9071/SW-R671/ST-9071

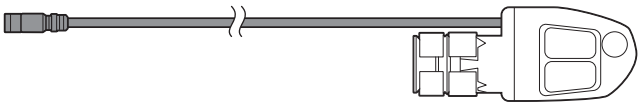
Junction (A)



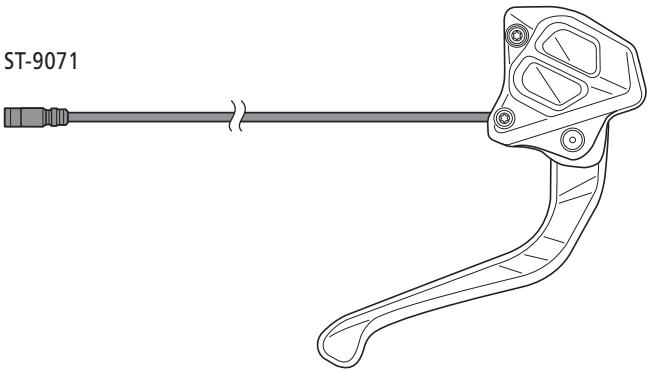
SW-9071



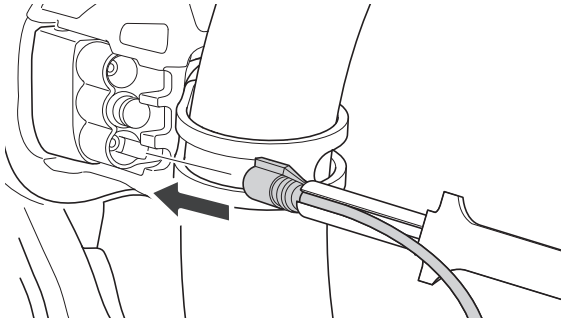
SW-R671



ST-9071



2. SW-R610



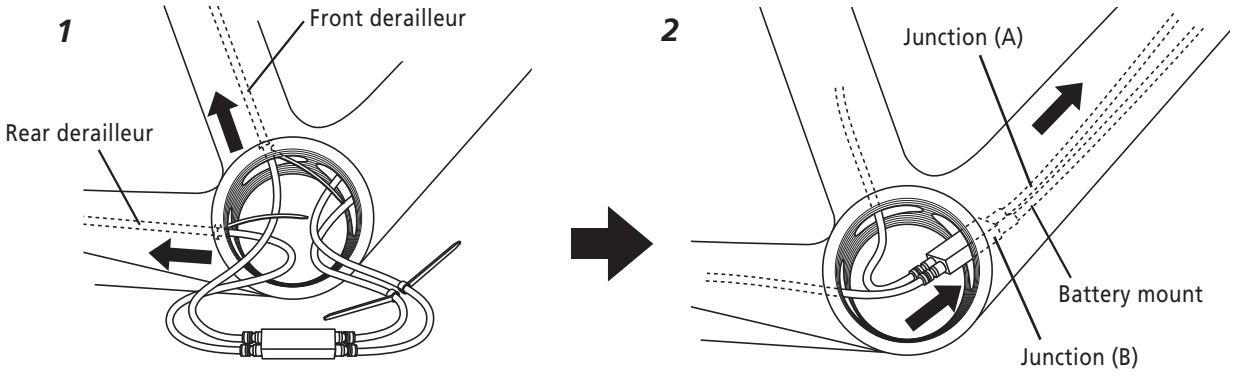
SW-R610



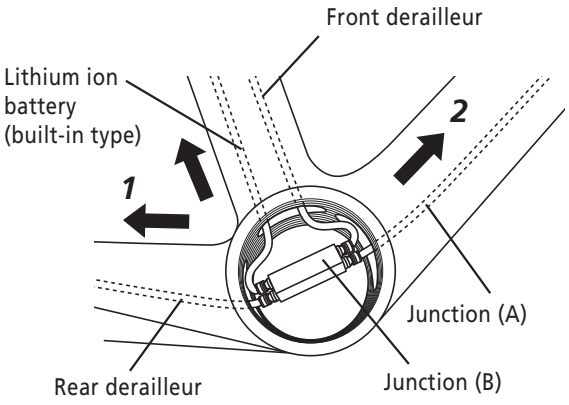
The port shape is different only for SW-R610.
Only ST-9070 is supported.

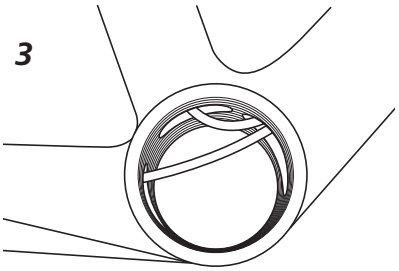
■ Routing junction (B) and the electric wires inside the frame

1. Pass the electric wires for the front derailleur and the rear derailleur through the seat tube and chainstay respectively.
2. Pass the electric wires for junction (A) and the battery mount and junction (B) through the down tube. Check that the screws of the bottom bracket shell do not damage any of the components at this time.
3. Set the electric wires so that only the electric wires for the front derailleur and the rear derailleur are visible inside the bottom bracket shell, and if any extra parts such as wire holders are protruding, push them back inside the frame.



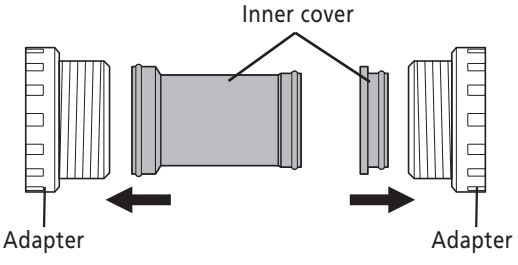
< SM-BTR2 >





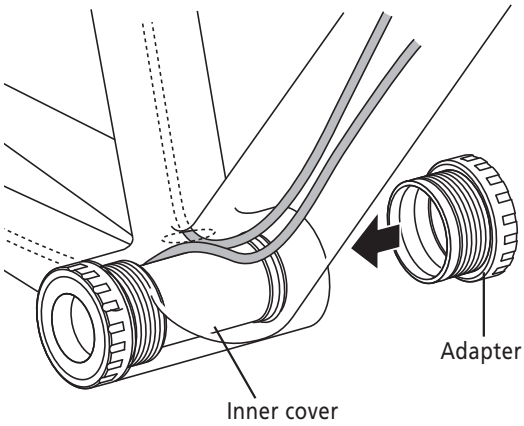
■ Assembly of the bottom bracket

1. When installing the inner cover to the bottom bracket shell, make sure that the electric wires for the front derailleur and the rear derailleur pass over the top of the inner cover.
2. Install the inner cover to the bottom bracket adapter.



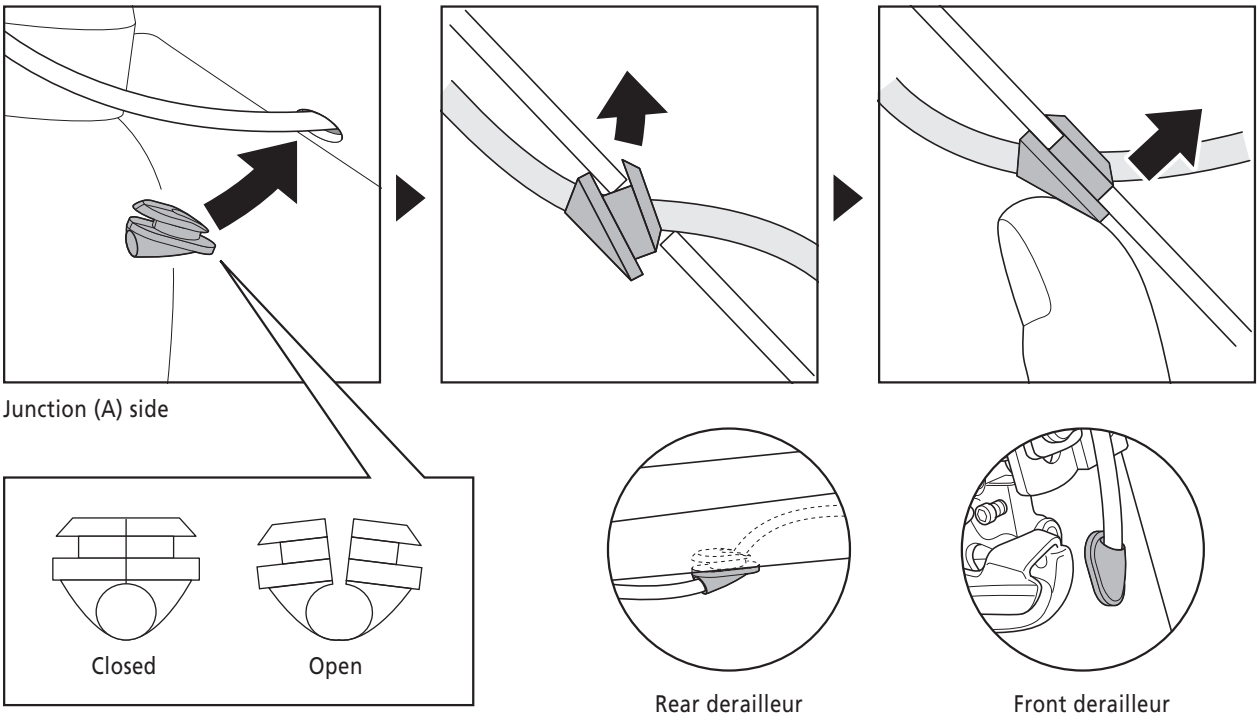
Note:

If using a frame which does not have enough space between the inside of the bottom bracket shell and the inner cover to route the electric wires use an inner cover which is sold separately.



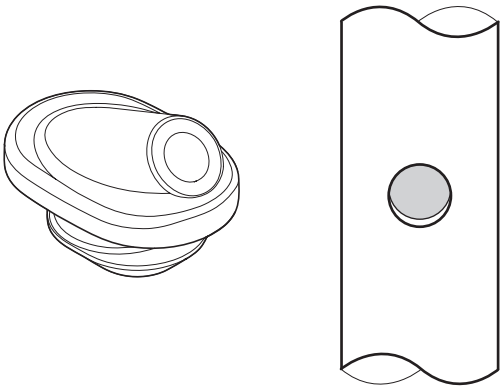
■ Installation of the grommets

Install grommets in appropriate positions for the electric wires by inserting the bottoms into the holes in the frame and then pushing the tops to fit them into place.

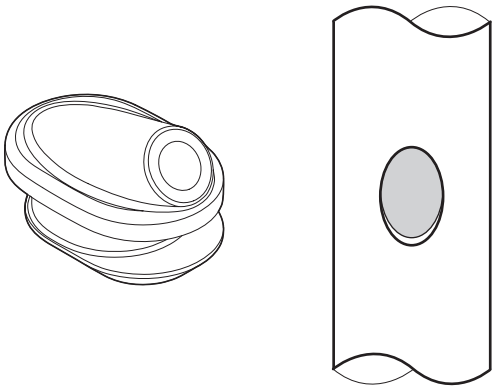


There are two types of grommets.
Choose one according to the shape of the hole in the frame.

Circle: SM-GM01



Ellipse: SM-GM02

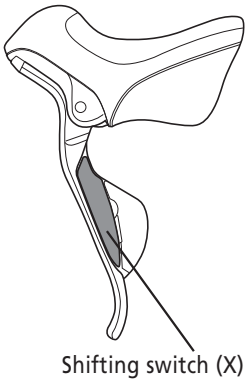


■ Checking connections

After connecting the electric wires to all of the components, install the battery and check the operation.
Operate the shifting switches and check that the front derailleur and rear derailleur both operate.

Note:

To prepare for chain installation, if none is installed, be sure to operate the shifting switch (X) of the left lever one or more times to set the front derailleur to the largest chainwheel.
After that, be sure to remove the battery.

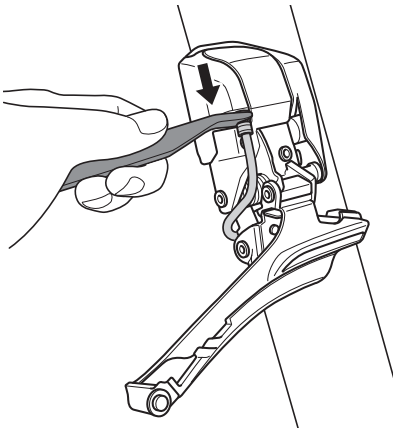


■ Disconnection of the electric wires

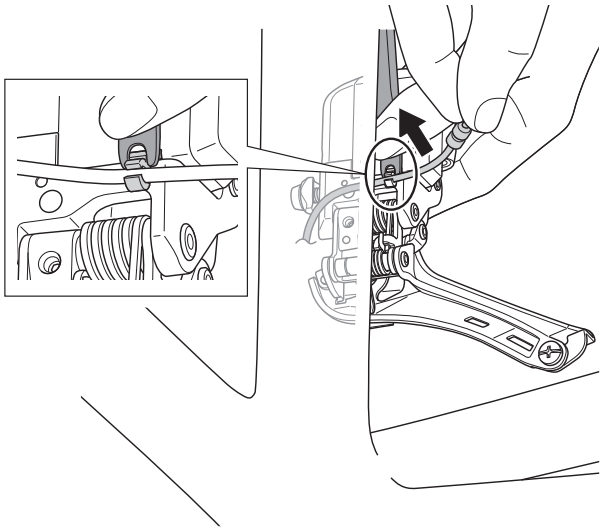
This is a small waterproof connector. Do not repeat connecting and disconnecting it. The waterproof section or the connecting section may become worn or deformed, and the function may be affected.

When removing the electric wire, use the wider end of the special tool TL-EW02 as shown in the illustration. If you pull too firmly on the connectors, problems with operation may occur.

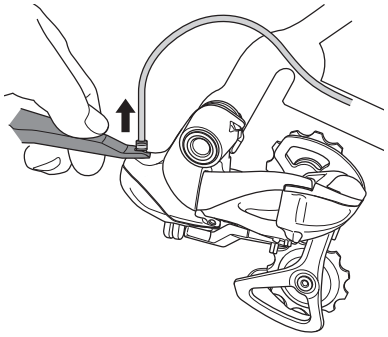
* With the base portion of the hook firmly held down using the wider end of the special tool TL-EW02, remove the electric wire.



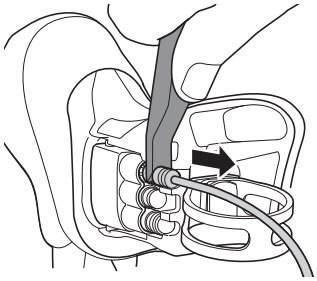
FD-9070



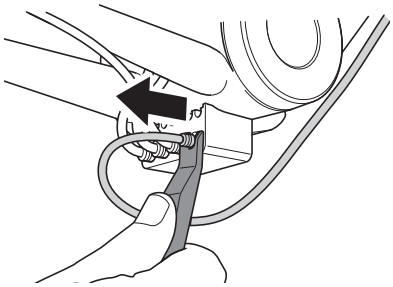
Remove the electric wire from the cable holder.
If the electric wire is difficult to remove, remove the rear wheel. If you forcibly remove the electric wire, you may damage the wire.



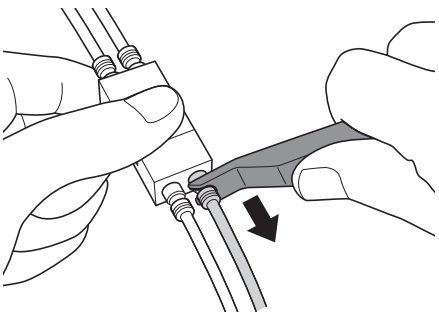
RD-9070



ST-9070



SM-JC40



SM-JC41

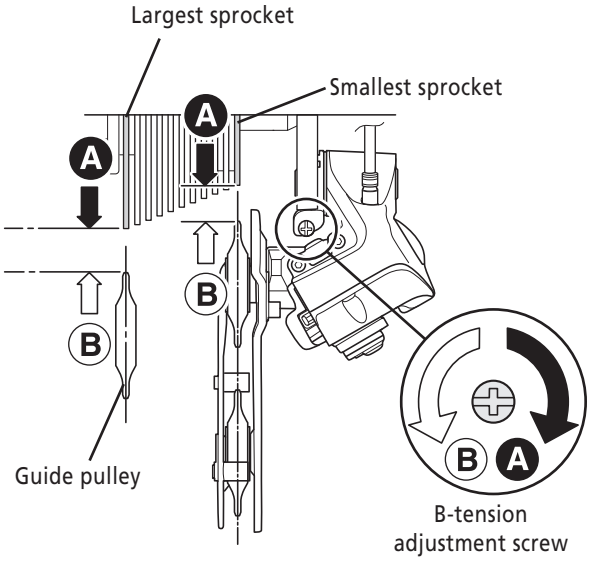
ADJUSTMENT

■ Adjustment of the rear derailleur

1. Install the battery.

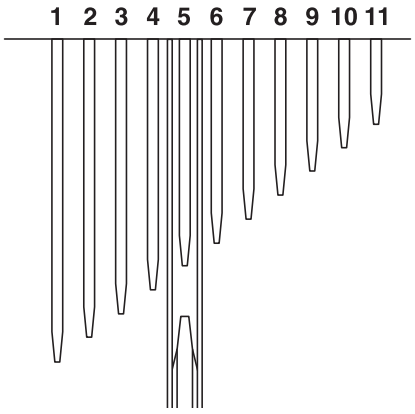
2. Adjust the B-tension adjustment screw.
Mount the chain on the smallest chainring and the largest sprocket, and turn the crank arm backward. Then turn the B-tension adjustment screw to adjust the guide pulley as close to the sprocket as possible but not so close that it touches.

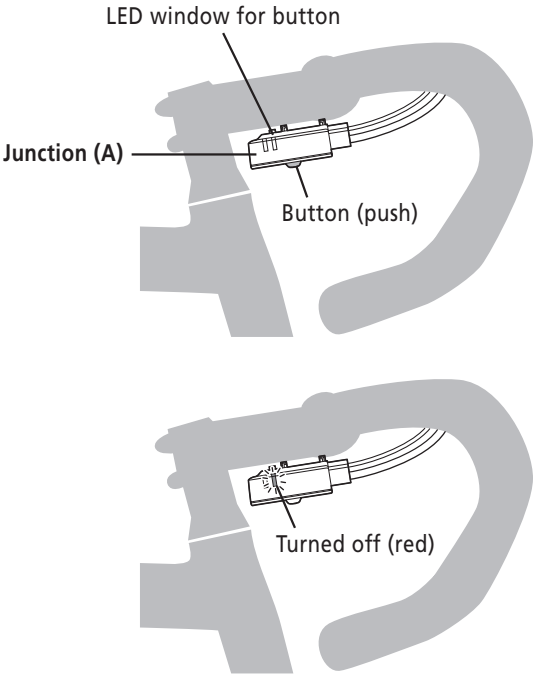
Next, set the chain to the smallest sprocket and repeat the above to make sure that the pulley does not touch the sprocket.



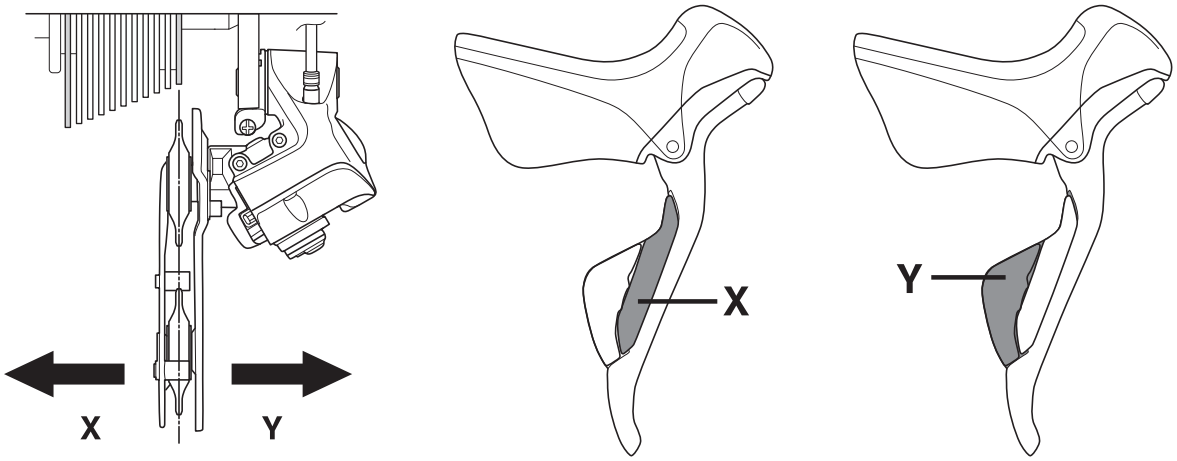
3. Shift the rear derailleur to the 5th sprocket position.
Press the button at the junction (A) until the red LED illuminates in order to switch to rear derailleur adjustment mode.
Note that if you keep pressing the button after the red LED has illuminated, protection recovery operation will begin.

* For details on the protection function, read "Protection function" in the user's manual for the rear derailleur (Di2).

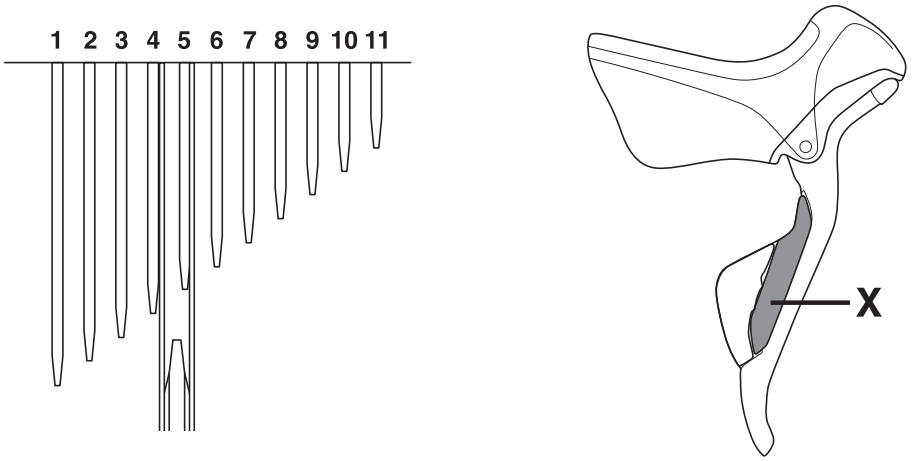




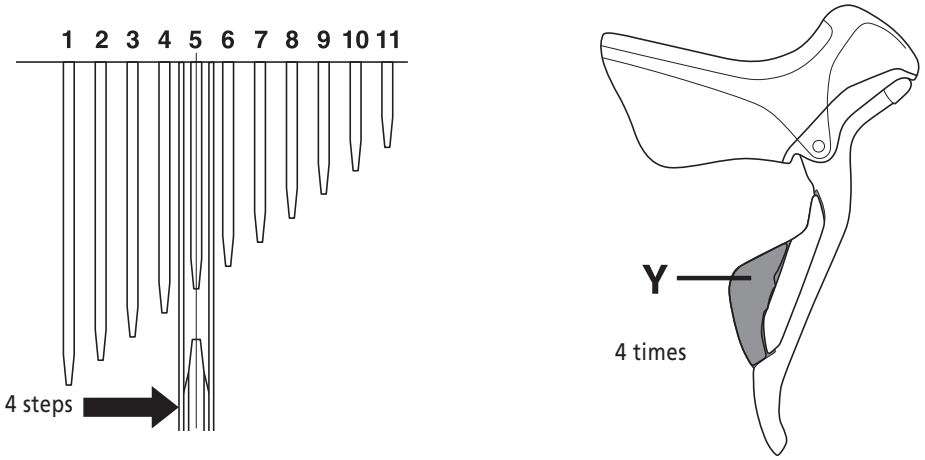
4. If shifting switch (X) is pressed once while the initial setting condition is active, the guide pulley will move one step toward the inside.
If shifting switch (Y) is pressed once, the guide pulley will move one step toward the outside.
The guide pulley can move 12 steps inward and 12 steps outward from the initial position, for a total of 25 positions.
When adjusting, the guide pulley will overrun slightly and then move back in an exaggerated movement so that you can check the adjustment direction. When checking the positions of the guide pulley and the sprocket, check at the position where the guide pulley finally stops.



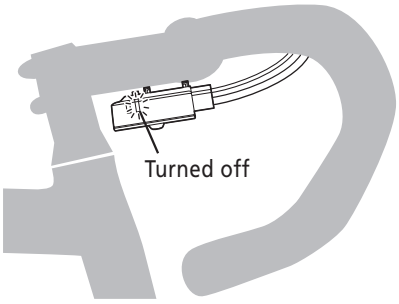
5. While turning the front chainwheel, operate shifting switch (X) to move the guide pulley toward the inside until the chain touches the 4th sprocket and makes a slight noise.



6. Next, operate shifting switch (Y) 4 times to move the guide pulley toward the outside by 4 steps to the target position.



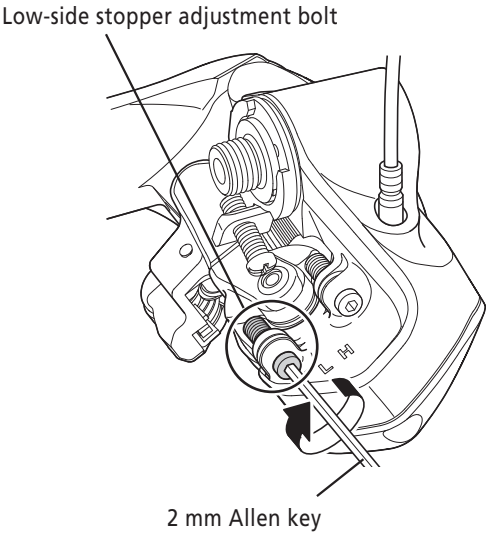
7. Press the button at junction (A) until the red LED turns off in order to switch from rear derailleur adjustment mode to gear shifting mode. Shift to each gear and check that no noise is generated at any gear position. If fine adjustment is needed, switch back to adjustment mode and readjust the rear derailleur.



8. Then make an adjustment with the stopper bolt.

< Adjustment of the low-side stopper bolt >

Shift the rear derailleur to the largest sprocket, and then tighten the low adjustment bolt until it touches against the stopper.
If it is tightened too much, the motor will detect a problem and gear shifting operation will not be carried out correctly.

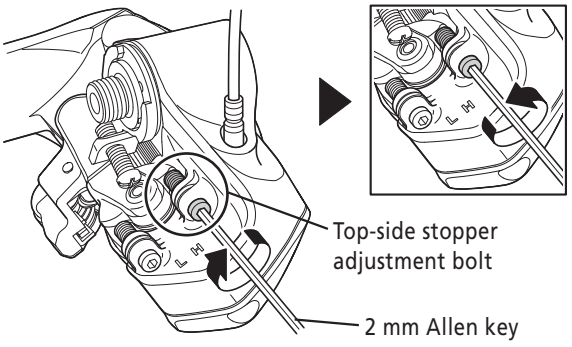


Phenomenon that occurs due to an excessively tightened adjustment bolt

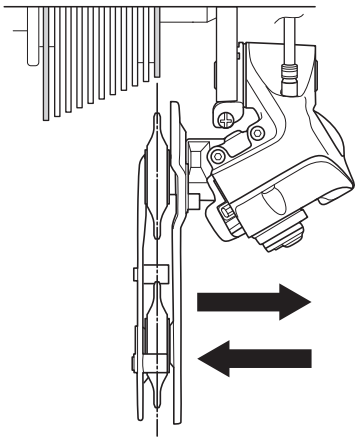
- Gears do not shift to the top/low gear.
  (Even if you shift gears to the top or low gear, the gear may shift back by one gear after about 5 seconds.)
- Noise does not stop.
- Battery charge disappears quickly.
  (load is being placed on the motor.)
- The motor may be damaged. (irreparable)

< Adjustment of the top-side stopper bolt >

Shift the rear derailleur to the smallest sprocket, and then tighten the top-side stopper adjustment bolt until it touches the stopper at the position where the rear derailleur finally stopped. From this position, turn the top adjustment bolt counterclockwise one turn so that an over-stroke allowance can always be maintained.



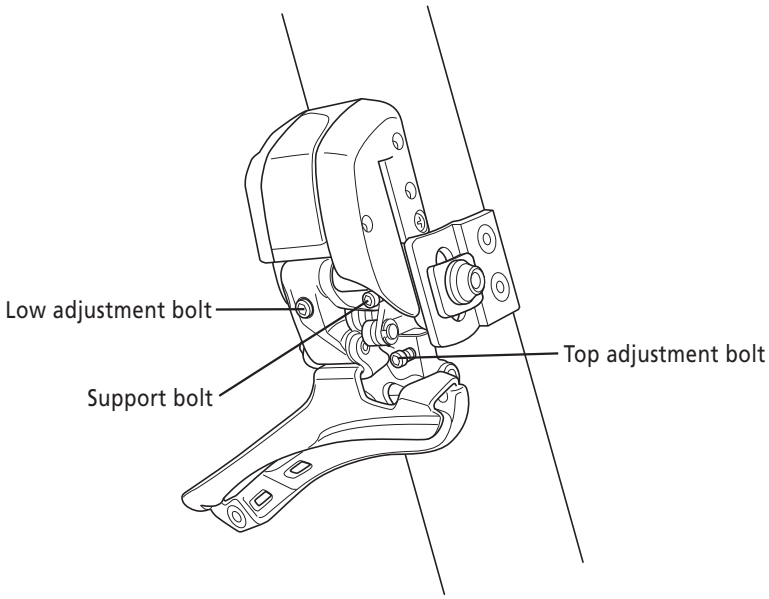
By shifting from a largest sprocket to a smallest sprocket, the rear derailleur will move toward the outside by the over-stroke allowance and then move back.



■ Adjustment of the front derailleur

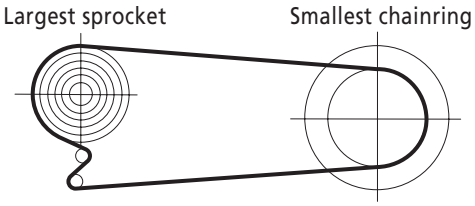
Note:

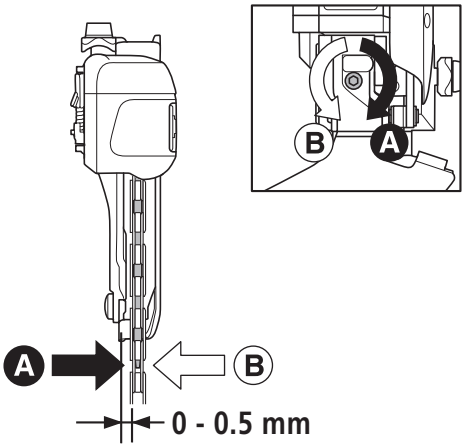
The low adjustment bolt, the top adjustment bolt and the support bolt are close to each other. Make sure that you are using the correct bolt for adjustment.



< Low adjustment >

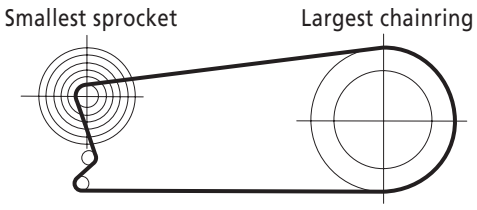
Set the chain onto the smallest chainring and the largest sprocket. Use a 2 mm Allen key to turn the low adjustment bolt to adjust so that there is a clearance of 0 - 0.5 mm between the chain and the chain guide inner plate.

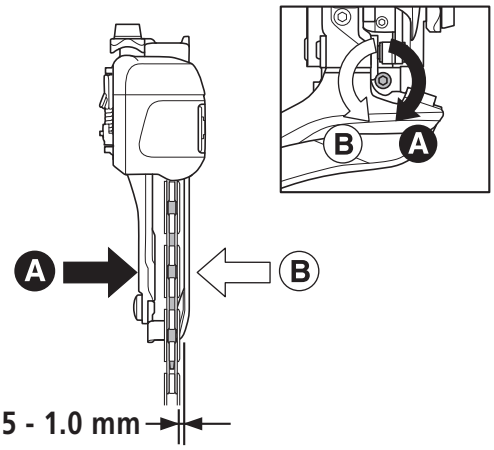




< Top adjustment >

Next, set the chain onto the largest chainring and the smallest sprocket. Use a 2 mm Allen key to turn the top adjustment bolt to adjust so that there is a clearance of 0.5 - 1.0 mm between the chain and the chain guide outer plate.

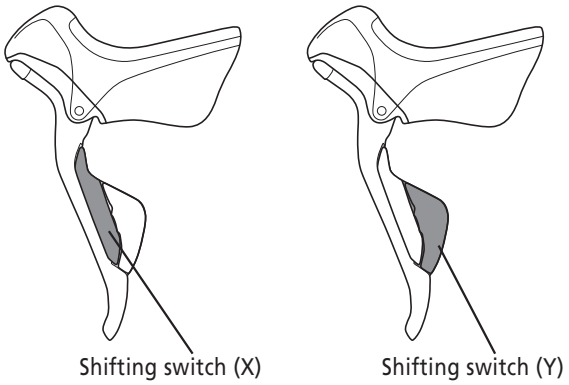


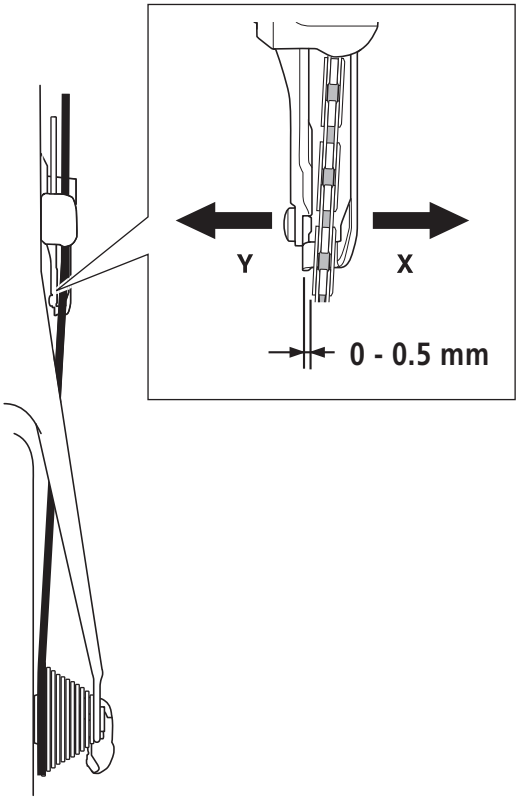


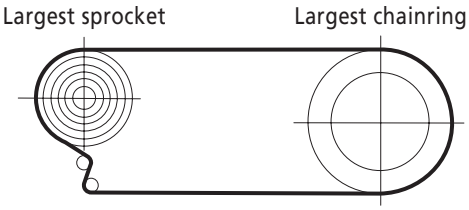
< Top position electrical adjustment >

Set the rear derailleur to the largest sprocket.
Press the adjustment button of junction (A) to enter adjustment mode.
Adjust the gap between the chain and the front derailleur to 0 to 0.5 mm using the shifting switch (X) or the shifting switch (Y).

The adjustable range is 25 steps.
(12 steps inward and 12 steps outward from the initial position)







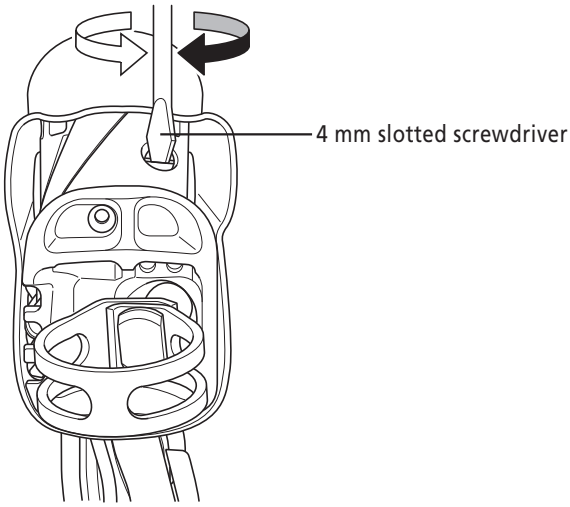
Finally, shift the front derailleur and the rear derailleur to all gears to make sure that the chain does not contact with the chain guide.

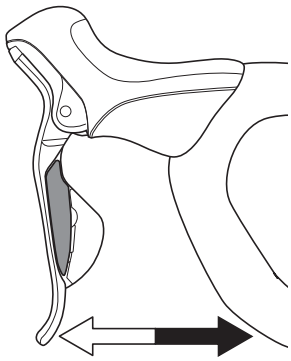
■ Lever stroke adjustment

Make sure that the braking operates after the adjustment.

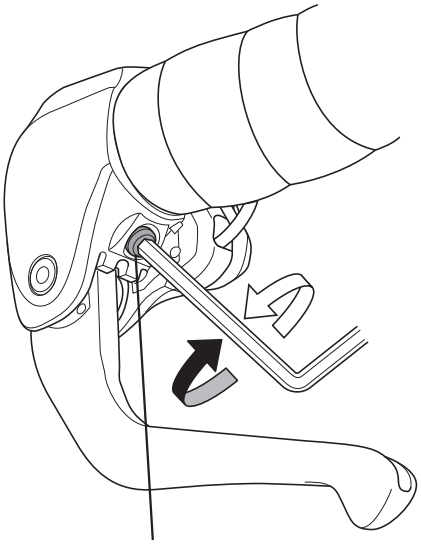
ADJUSTMENT: **Clockwise**: The lever stroke becomes narrower.
Counterclockwise: The lever stroke becomes wider.

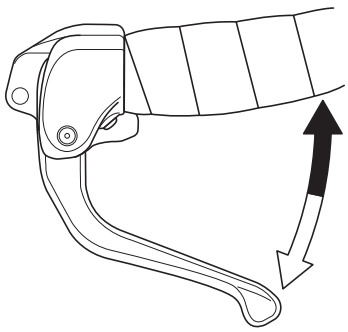
< ST-9070 >





< ST-9071 >





Two types of adjustment bolts are provided, but they function the same way.

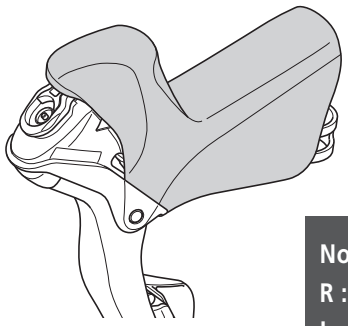
- 3 mm slotted screwdriver
- 2 mm Allen key

■ Replacing the bracket cover

* Always replace the bracket cover with the lever removed from the bicycle as shown in the illustration.

The tabs on the bracket cover each fit to a matching slot on the bracket.

- Wipe a little rubbing alcohol inside the bracket cover to make figure easier.

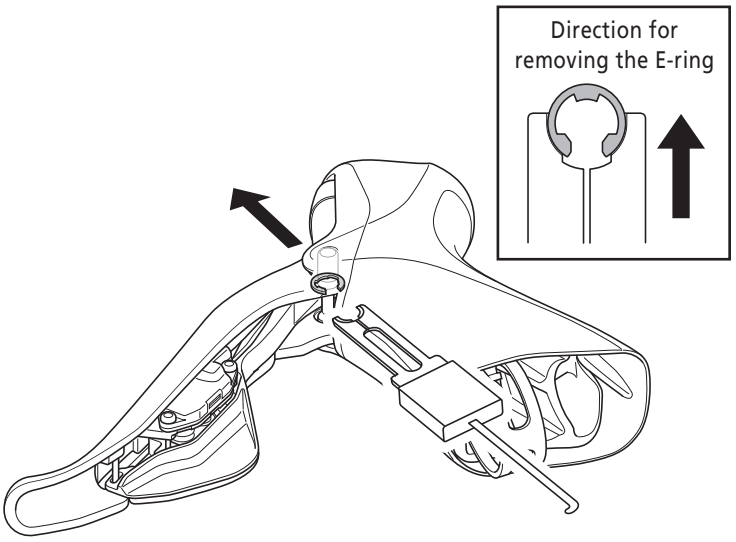


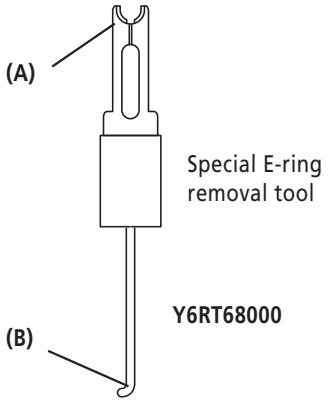
Note the markings:
R : for right
L : for left

* A label is engraved in the bracket cover.

■ Disassembly of the bracket unit and lever unit

1. Use the special tool which is sold separately to remove the E-ring.
Align part B of the special tool with the removal direction of the E-ring. Next, set part A onto the E-ring and remove the E-ring.

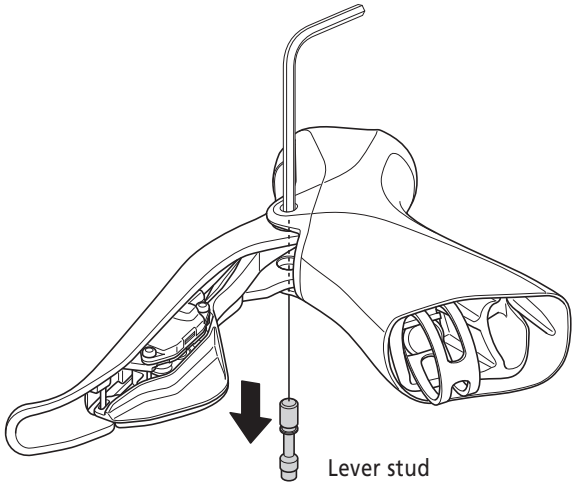




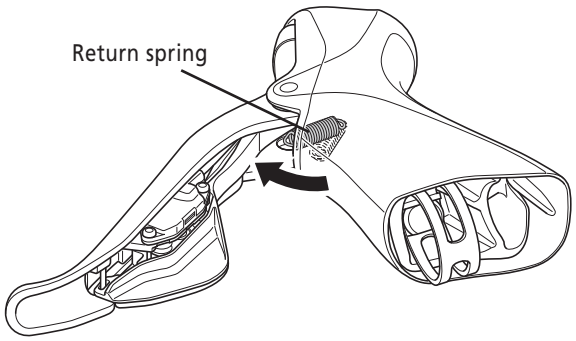
⚠ CAUTION

When you remove the E-ring, it may pup out; wear protective glasses while removing it. Check that there is no one or no object around you before starting the work.

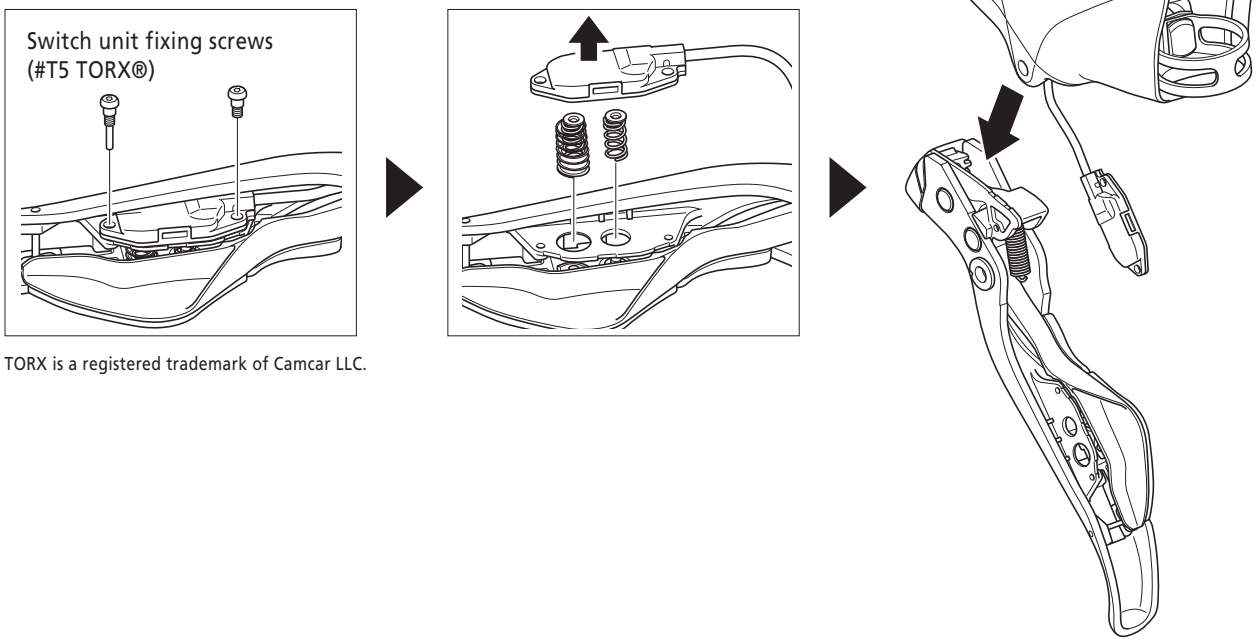
2. Insert an Allen key or a similar tool into the hole in the lever stud, and then tap it with a plastic mallet to push out the lever stud.



3. Remove the return spring.



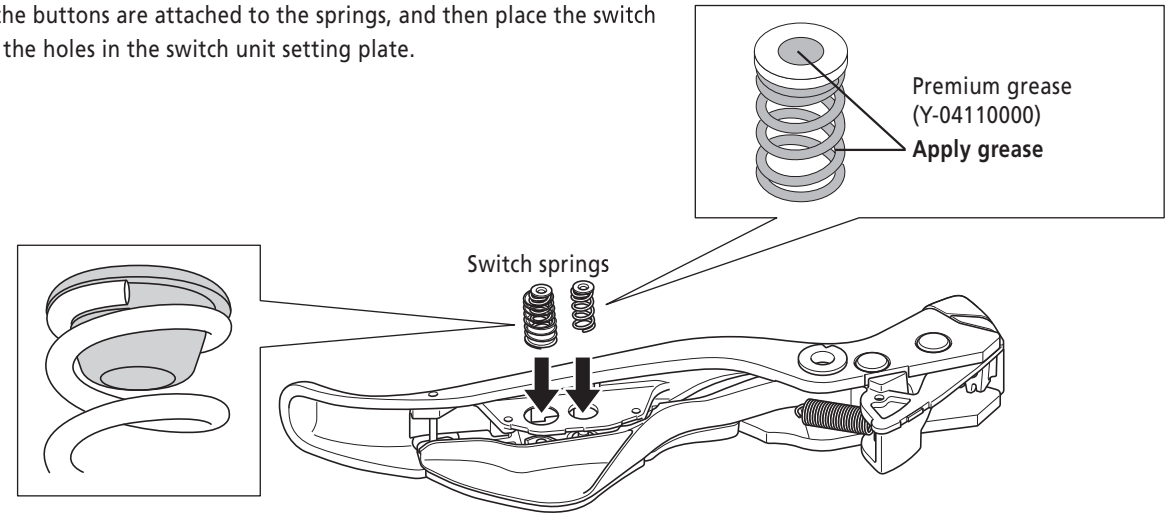
4. Remove the two switch unit fixing screws, and then remove the switches and the switch springs. The bracket unit and the lever unit can then be disassembled.



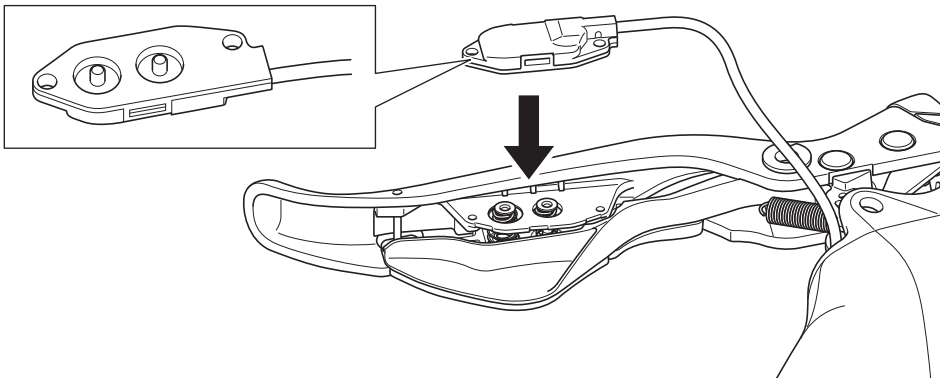
TORX is a registered trademark of Camcar LLC.

■ Assembly of the switch unit

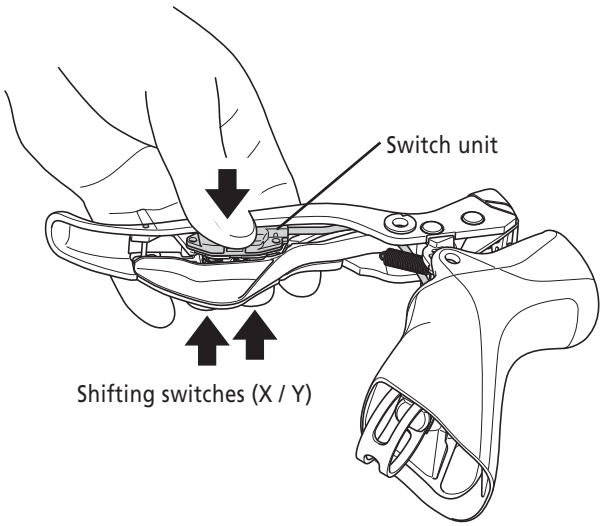
1. Check that the buttons are attached to the springs, and then place the switch springs into the holes in the switch unit setting plate.



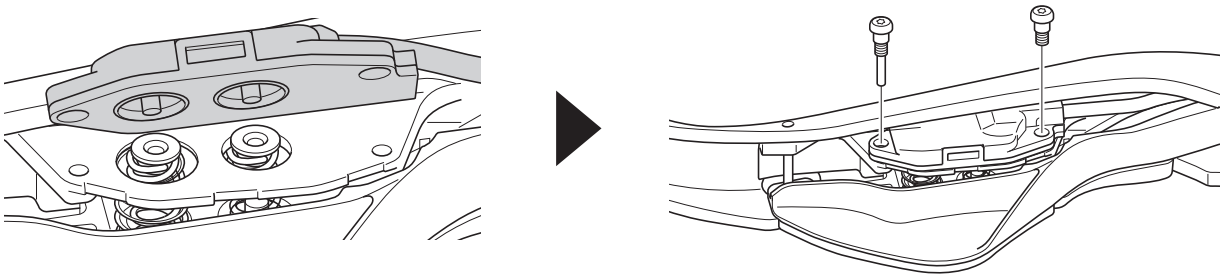
2. Place the switch unit against the mounting surface of the switch unit setting plate.



3. Press the switch unit by hand so that the switch springs go into the grooves in the buttons, and then push the shifting switches (X / Y) in as far as they will go.



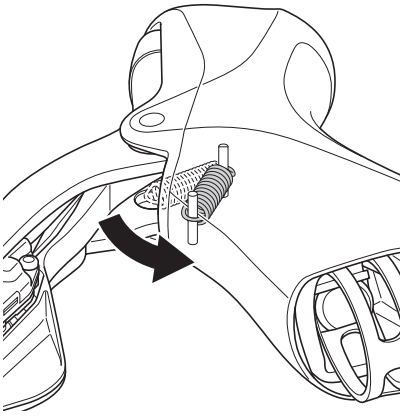
4. Make a gap between the switch unit and the switch unit setting plate and check that the end of the rubber on the switch unit is on the button.



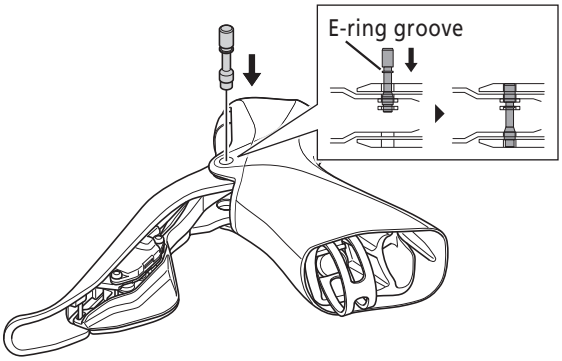
Tightening torque:
0.18 N·m {2 in. lbs.}

■ Assembly of the bracket unit and lever unit

1. Assemble the bracket unit and the lever unit, and then attach the return spring.

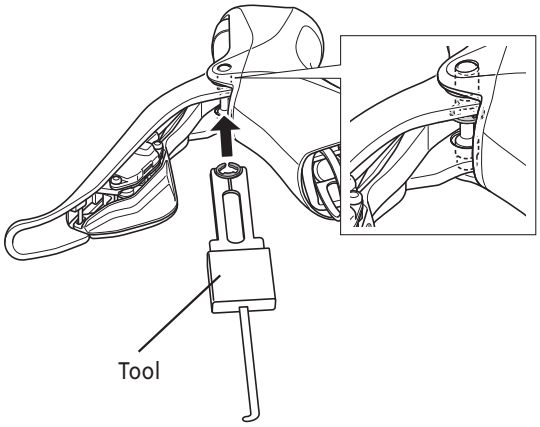


2. Align with the hole in the stud, and then press-fit the lever stud.



* The correct direction for the lever stud is when the E-ring groove is at the top.
* Check that the surface of the bracket unit and the top end of the lever stud are flush with each other so that the E-ring will fit into the groove.

3. Use part A of the special tool to install the E-ring.



* Operate the shifting switches (X / Y) and check that they turn on, and check that the lever operates smoothly.

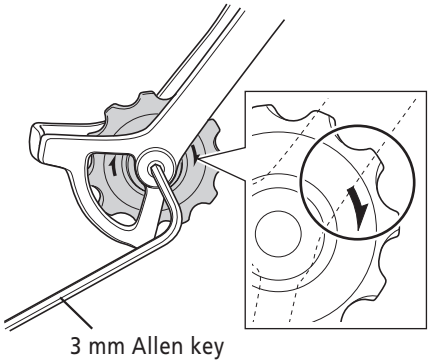
Note:

Do not use the removed E-ring again.
Be sure to use a new product (Y46RU41100: service parts code).

■ Replacing the pulley

Replace the pulley using a 3 mm Allen key.
Apply sufficient grease to the inside of the pulley cap.

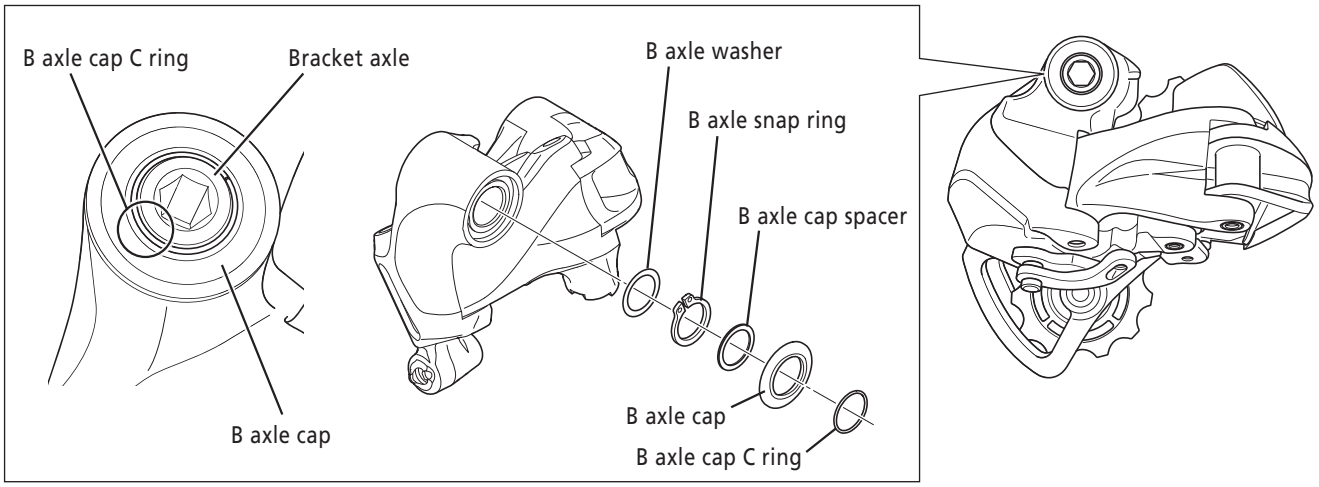
Guide pulley / Tension pulley
Tightening torque:
2.5 – 5.0 N·m {22 – 44 in. lbs.}



■ How to install the B axle and B axle cap

Removing the B axle cap

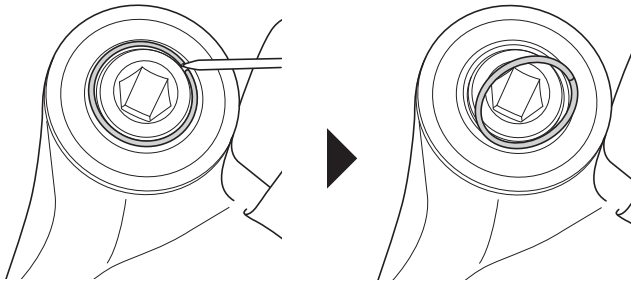
1. Hold the B axle cap and the B axle cap C ring.

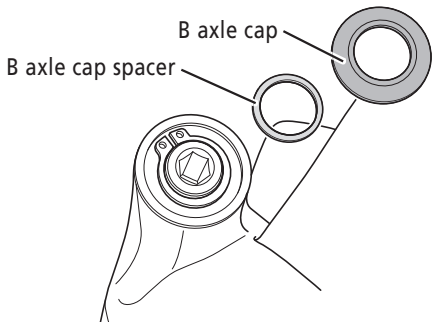


2. Widen the slit in the B axle cap C ring using a pointed tool, and then remove the B axle cap C ring, the B axle cap, and the B axle cap spacer.

⚠ CAUTION

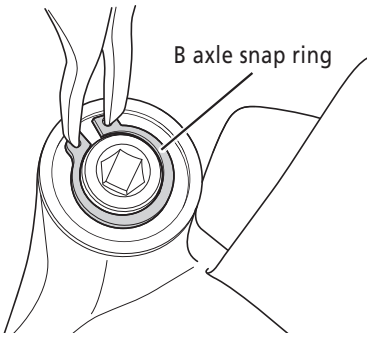
Be careful when working so that your fingers will not get injured by the pointed tool.

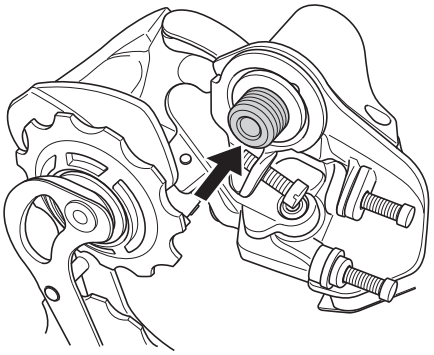




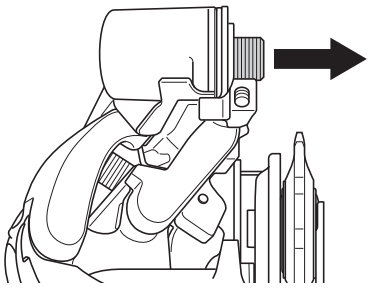
Removing the B axle

1. Widen the B axle snap ring using snap ring pliers, and then remove the B axle. Remove the B axle while pressing it in the direction of the arrow.





2. Remove the B axle washer and remove the B axle from the bracket body in the direction of the arrow.

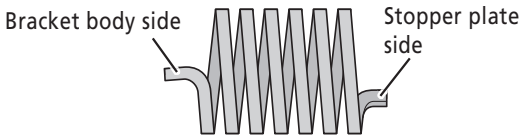


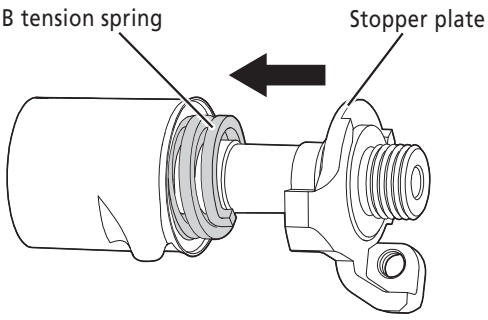
Mounting the B axle

Note:

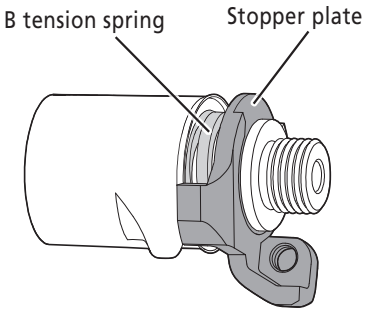
Apply sufficient grease on the sliding portions (B axle, B axle bearing, B axle washer, stopper plate) and the B tension spring.

1. When mounting the B tension spring, insert the longer end of the spring into the bracket body side and the shorter end of the spring into the hole on the stopper plate side.

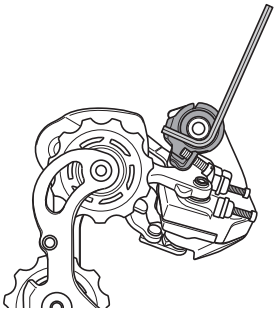




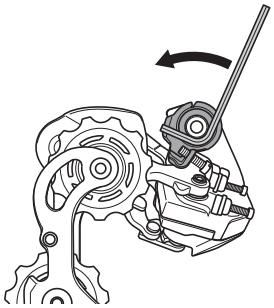
2. Temporarily assemble the B tension spring, B body seal ring, stopper plate (equipped with the B tension adjustment screw) and B axle to the B body.



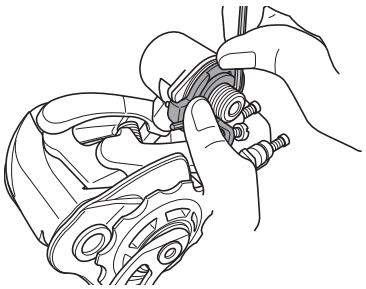
3. Hook a 3 mm Allen key as illustrated in the figure, and then turn the key counterclockwise.



4. Turn the Allen key until the claw on the stopper plate cross the claw on the B body.



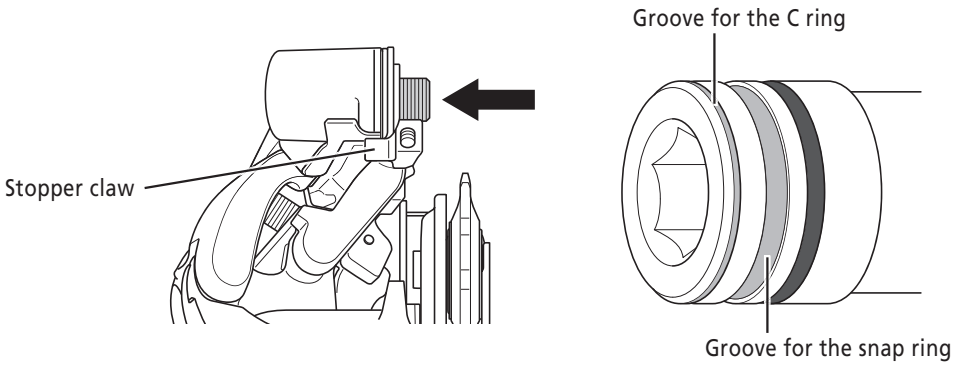
5. Insert the Allen key. If it is difficult to insert the Allen key, push it in by moving it slightly.



6. Hook the stopper plate on the stopper claw on the bracket body, insert the B axle washer while applying pressure on the B axle, and then insert the B axle snap ring using snap ring pliers. Be careful not to be confused with the groove for the B axle cap C ring.

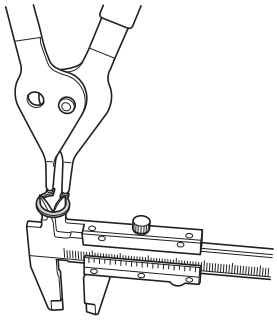
Note:

Apply sufficient grease on the B axle washer before installation.



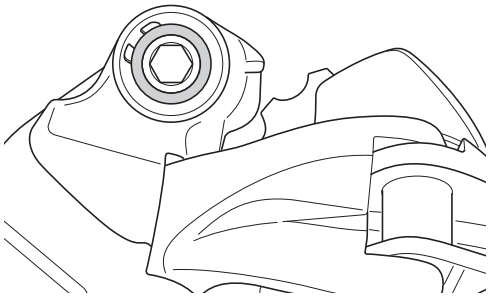
⚠ CAUTION

Be careful not to make the B axle snap ring deformed and wider than the external diameter of the B axle. (If the inner diameter of the snap ring is widened to ϕ 10.15 mm or larger during assembly, the snap ring is deformed.)
Check that there is no play between the snap ring and the diameter of the B axle after assembly. If there is any play, the snap ring is deformed.
This may cause the B axle to come off and you may fall down. Replace the snap ring with a new one.

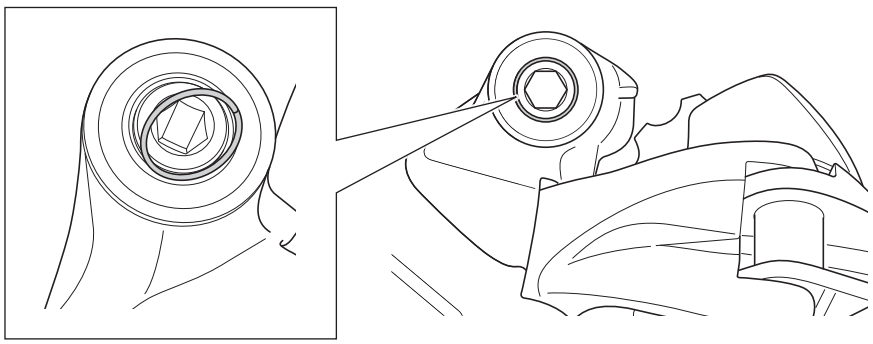


Mounting the B axle cap

1. Mount the B axle cap spacer to the bracket body.



2. Mount the B axle cap and then mount the B axle cap C ring. Check that the C ring is securely mounted to the groove on the B axle.



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